

Best
of the Year
Awards — 1986

DEC 1986
Vol. 3 No. 8

GUIDE

TO COMPUTER LIVING

FOR *COMMODORE*™ OWNERS

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Computers: The New Psychedelic An Interview with Dr. Timothy Leary

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for FastFile

REVIEWS:

KrackerJax
LogiStix
World Games
Partner 128
Art Pak No. 1
Two on Two
Mean 18
Leaderboard Golf
Transformers
Tass Times in Tonetown

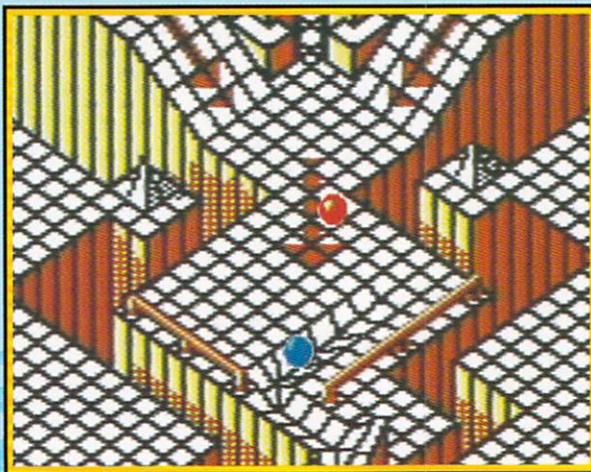


Go Ahead, Lose Your
Marbles...

MARBLE MADNESS

is Here !!!

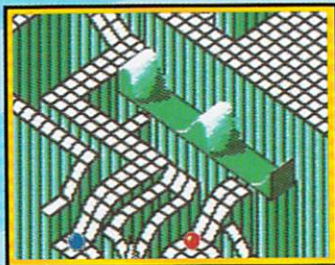
The game that drove you crazy at the arcades now comes home. Same exciting gameplay, same blow-away graphics, sounds and music. We've even added an incredible all-new secret level.



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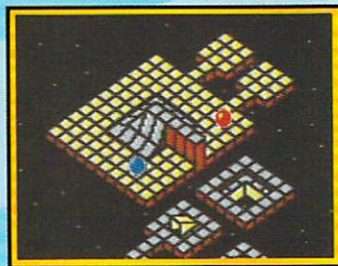
Spectacular Animation

Fantastic 3-D terrains are the raceways. Zany (but dangerous) enemies await your every turn. Avoid the deadly steels and the pounding hammers. Watch out for the hungry marble munchers. Even surf a mechanical wave!



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ROBERTS' RULES OF INALIENABLE COMPUTER ORDER

- 1 You will never have an extra blank disk.
- 2 If you do bring along a blank disk, you won't need it.
- 3 If you don't bring along a blank disk, it will be the only available opportunity to obtain a copy of a hitherto unattainable, and uniquely appropriate program.
- 4 If someone else is watching while you are doing anything on the computer, anything at all, it will screw up. (a technical term.)
- 5 The percentage chances of screwing up increase in direct proportion to the size of your audience. If you are demonstrating anything to a User Group your chances of crashing are about 487 to one in favor. But if you should happen to be demonstrating anything on national television, you don't really have a chance. Or a prayer.
- 6 No matter how simple it seems to you, your explanation will be more than s/he wants to know.
- 7 You will amaze yourself at how much you know.
- 8 You will amaze your Mother at how much you know about computers.
- 9 Your Mother will believe that you have an alternate career just waiting to throw money at you.
- 10 Your Mother will be wrong.
- 11 None of your old friends will want to play computer with you.
- 12 You will make new friends.
- 13 You will always have one disk envelope too few. Or too many.
- 14 The only pieces of data you will ever lose are the ones you were going to save just as soon as you finished typing a couple more lines.
- 15 Any game you beat persons under the age of 9 at will automatically be deemed too easy.
- 16 The update of your program will use the keys for something entirely different in this version than it did when you first learned it.
- 17 The longer the copyright notice, the faster the program will get cracked.
- 18 You will not understand it the first time you read it in the manual.
- 19 You will understand it better the next time you read the manual. For no discernible reason.
- 20 When you are late for an interview and need a last minute copy of your resume your printer will go down. It will always go down. It doesn't care.
- 21 Nowhere in your repair manual will it ever tell you what you really need to do - which is to turn the damn thing off and get yourself a cup of tea.
- 22 You will never know what a user file is.
- 23 The price of anything you buy will stay the same until the actual impact of your money on the bottom of the cash drawer, at which time it will automatically re-list itself in next Thursday's paper at 30% less.
- 24 Staring at the screen for 97 continuous minutes will not necessarily reveal to you the secret location of any colon that should have been typed in as a semi. Or vice versa.
- 25 It will always seem like your friend got a better deal.
- 26 No program you get from the New York Times will run on your computer.
- 27 The 800 number will be busy.

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THE GUIDE TO COMPUTER LIVING

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The Guide To Computer Living

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The Guide to Computer Living, ISSN # 0889-4108, is an independent monthly publication serving Commodore computer owners. The views expressed in *The Guide to Computer Living* are those of the individual writers and do not necessarily constitute an endorsement of a product. *The Guide to Computer Living* reserves the right to determine the acceptability of any advertising submitted.

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The Guide to Computer Living is published monthly (and is available by subscriptions at the following rates: 1 year-\$18.00; 2 years-\$35.00; 3 years-\$48.00) by Aquarian Communications, Inc., 3808 S.E. Licynta Court, Portland, Oregon 97222. Second class postage paid at Portland, Oregon. POSTMASTER: Please send address changes to *The Guide to Computer Living*, 3808 S.E. Licynta Court, Portland, Oregon 97222.

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RND (Ø) NOTES:

Has Commodore Killed C-128?

by Randy Chase

Confusion often seems to be the common denominator in the Commodore world. The latest source of conflicting information is the future of the 128, or the lack thereof, depending on to whom you listen, and whom you choose to believe.

I've never made any secret of my love for the 128 PC. I still feel that armed with PaperClip and SuperBase it is a powerhouse productivity machine. Byte magazine recently compared it favorably to an IBM PC. And, of course, it *does* run all of those 64 games. So, you ask, what is the controversy?

The latest round of rumors that have been trickling in deal with Commodore's possible decision to discontinue the C-128! But not until after the Christmas shopping binge that is about to begin. I've been hearing this report from a variety of sources, both reliable and not so reliable. However, in the last two weeks the story has come from people within the industry that aren't known for perpetuating idle rumors and who must make their plans based on factual information.

So, what seemed like idle gossip and commonplace Commodore paranoia suddenly is a matter of some concern. From a consumer's point of view, knowing whether or not a computer is going to be discontinued after Christmas could be a major concern in their purchasing plans. From an industry point of view, the matter is crucial to developers who are committing resources to the continued development of C-128 products.

Talking to Commodore Vice-President Clive Smith, he assured me that there are no plans of any kind to discontinue the 128. "The 128 is in our build plans for all of next year", he assured. Why then, I wondered, are many people in key industry positions telling me that they've been told by Commodore of this scheduled change of course in January? Smith acknowledged that the emphasis at Commodore next year is going to be on other 6502-based products, and that perhaps some developers were misinterpreting the situation. He also pointed out that by the end of the Christams season, Commodore will have sold over one million 128's.

The "other 6502-based products" referred to are most likely the new 1764 RAM disk for the 64C which will come packaged with a beefed-up 128-style power supply. This is, incidentally, the RAM disk that GEOS will be utilizing to breath new speed and accessibility into this alternative operating system for the 64.

Reassured by Commodore that they have no plans to abandon the 128 after Christmas, or anytime in the near future, it would seem that we've resolved the matter. Or have we? There may be some underlying factors and some yet unannounced products that warrant further discussion.

It would appear that Commodore has a structural problem in the interrelationships of their current product line. At the bottom end, they have the new GEOS-equipped 64C at an increased price. Next up the line is the 128, which, when compared on

the basis of system cost, is overpriced in comparison to the Atari ST. At the top of the current line is the Amiga 1000, the technological darling of the industry.

In an attempt to defuse the significant price advantage enjoyed by the Atari ST, Commodore is expected to announce a new, lower-priced Amiga in January at the Winter Consumer Electronics Show. While the project is still in the "no comment" stage at Commodore, developers are reporting that the new mass-merchandised *little* Amiga will be limited to 512K and will be priced to compete directly with the Atari ST. While the new machine will be completely compatible with the current Amiga 1000, the price reduction will come from a combination of a new design of the plastic case and the elimination of the costly expansion bus that provides an open door for upward expansion.

This is a positive step in the right direction for Commodore. An affordable home version of the Amiga should prove to be the critical key in their attempts to regain their financial footing. With the ever-growing base of powerful productivity software, the Amiga 1000 (and an upscale model) will continue to find their niche in the IBM world of bigger *serious* computers. With a cheaper version designed for the home market, Commodore can capitalize on the fact that the Amiga *is* also the most remarkable game machine the world has ever seen.

So the overall picture for 1987 looks rosy for the folks in West

Chester. But wait a minute. The solution to the problem spawns a new problem of its own. With the little Amiga targeted to fall into the price range of the Atari ST, Commodore may be complicating the currently awkward pricing structure of their product line. If the new Amiga hits the stores with a price tag that can compete with the ST, what impact is that going to have on the 128?

Come January, Commodore might have to do some significant adjusting to establish a product line that has a logical price structure. With the amount of energy and resources devoted to the GEOS/64C, it's hard to imagine Commodore making any changes there. With the low spread between the 128 and the 64C, there really isn't room to lower the price of the 128 without endangering their current prodigy, the *new-look* 64C. So, friends, where do you imagine this scenario will lead?

It would seem that Commodore has one too many computers to fit between \$200 and \$1000. My uninvited suggestion would be to drop the 64. After all, it is safely snuggled right there inside the 128. By focusing on producing the 128 in larger numbers, they could possibly bring the price down closer to the 64C cost. That would open up the mid-range price for the new Amiga. A commitment to GEOS could be salvaged quite nicely by the release of a 64/128 version operating in whichever mode the user desires.

Unfortunately, I doubt that such a scenario will be realized. Part of the problem lies in the unprecedented success of the Commodore 64. It has been the financial lifeline that pulled Commodore through its series of financial crises. I imagine that discussions of discontinuing it would border on blasphemy in the corporate board. If a head is to roll, the 128 is the probable amputee.

Personally, I want to believe Commodore. I think that the 128 is the ideal entry level computer. It offers not only the appeal of the "Model-T of the computer industry" in its 64 mode; but it also adds an enhanced productivity that the 64 (even with GEOS) just can't rival. But some of those rumors are growing beyond the whisper stage, and the people sharing off-the-record insights aren't standing in dark alleys wearing rain coats.

Stay tuned next month as we continue to fit together the pieces that will eventually make up the road map that Commodore plans to follow into 1987.

The Best of the Year

As we wrap up the calendar year, we felt it appropriate to take a look back at the year in passing. In this issue you'll find our Best (and Not-So-Best) Awards for 1986. As well as making our editorial choices for Products of the Year and Programmer of the Year, we also recognize a variety of notable (and ignoble) achievements of the year.

One of our goals was to look behind the products at some of the people responsible for the magical spells cast via our computer terminals. Too often the company and the product get the spotlight and the programmers and producers go unrecognized. We've also asked our regular writers to offer their personal choices. No prerequisites here. Just their favorites, and a few words of explanation. Have fun, we did!

Exclusive Timothy Leary Interview

Before Dr. Leary joined our staff, I had the pleasure of spending some time with him. The results of our candid conversation can be found in this issue. His column will return next month; but in the meantime, I'm sure you'll be fascinated by this revealing look at

the man behind the myth. His perspective on the evolution of the electronic age is guaranteed to entertain and stimulate. We're pleased to offer the most in-depth and revealing look at Leary since his Playboy Magazine interview in 1966.

Christmas Games Roundup

Those of you buying Christmas gifts for computoids this season won't want to miss our January issue. We'll be taking a look at Games, including our recommendations of the best, both new and old. If you've got blanks on that Christmas list, we're sure to offer some fill-in solutions. We'll also be reviewing Defender of the Crown, which contains the most dazzling graphics I've ever seen on the Amiga or any other computer.



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Distributed exclusively by

Publishers Distributing Corp.

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Interview:

Dr. Timothy Leary, From the Psychedelic Sixties to the Electronic Eighties

by Randy Chase

Timothy Leary. Few names can stir such a litany of reactions. Despised, feared and hated by some; others credit him as a major shaper of their lifestyles and philosophies.

From his early days as an innovator in the field of clinical psychology to his political ambitions in a California gubernatorial race, Leary has led a varied, controversial life that overshadows many fictional heroes.

His research in psychology set trends and earned him a position at Harvard University. In the '60's, Leary's name became a household word when he urged a generation to Turn On, Tune In, and Drop Out. The publication of a 1966 Playboy magazine interview transformed Leary overnight into a media celebrity and he has been under the scrutiny of the international media ever since.

His experimentation with mind-altering drugs earned him notoriety and eventually led to an escapade as a fugitive and a term in prison, during mid-1970's, which shifted the intense media attention away from him. The years, however, have done nothing to dull his wit or to slow his incredibly fast mind.

Having been a more-than-casual follower of Dr. Tim since that Playboy interview two decades ago, I couldn't pass up the opportunity to meet him at an Electronic Arts press party last

summer in Chicago. After an entertaining demonstration of his Mind Mirror computer software, he agreed to an interview when his travel schedule next brought him to the Northwest.

In August, he finally traveled to the Pacific Northwest for a lecture at Willamette University in Salem, Oregon.

A Timothy Leary lecture is an entertaining and stimulating combination of historical perspective and futuristic prophecy. His voice soft but energetic, Leary at first gives the impression of meandering almost aimlessly through the vault of anecdotes he's collected over the years, liberally mixing the forward-looking philosophy that is his trademark.

While the listener is being swept along in his narrative, however, it eventually becomes apparent that Leary's technique is far from aimless. A variety of seemingly random, disjointed impressions and stories coalesce into an insightful pastiche of philosophy. The pauses, the asides and one-liners are the skillfully used tools of a master story teller who has spent the last 20 years exploring the potential of the media. Leary's wit is almost as legendary as his controversial experimentations with mind altering drugs.

Behind the almost mythical media personality, however, is one of the most charming and personable men I've ever met. As we talked, I couldn't help but contrast the reality of Timothy Leary

the man, with the wild-eyed, drug-crazed radical of the media. There is a distinctive and authentic charm, the kind of warmth that is seldom found outside of that WW II generation that spawned Leary.

While he often reasserts his intention to spark controversy, it is apparent after a few minutes of listening that Leary is much more than the rabble-rouser that the media built. He is one of the intellectual giants of our time. His thoughtful opinions added to his extensive background as a psychologist give a radically different perspective to his well-documented experimentation with chemical mind expansion.

For a man who has lived a life of celebrity and notoriety, he carries none of the pretensions or haughty illusions that burden so many in positions of fame. His friendly manner, his eagerness to please his audience, and his almost grandfatherly magnanimity stand as radical contrasts to the feared and hated madman accused by many of destroying the youth of the '60's.

In a lengthy personal interview following his lecture, it was obvious that Leary was a man firmly and realistically dedicated to his convictions. Not only does his mind move at an almost blinding pace in unique and fascinating areas, he has a gift for delivering a perfectly-timed one-liner that wins over even the skeptical.

Randy: In the 40's and 50's you were involved in a new wave of thought in the psychological world. In the 60's you were at the forefront of the cultural revolution. Now, in the 80's, you've moved into the electronic revolution. What is it that keeps Timothy Leary moving ahead and always at the forefront?

Dr. Leary: Flow! I just flow with the tide! George Harrison used a line from one of my early books, "We're floating upstream". If you just let the tide of evolution move you ahead you *have* to be involved in computers in 1986. Just stay afloat.

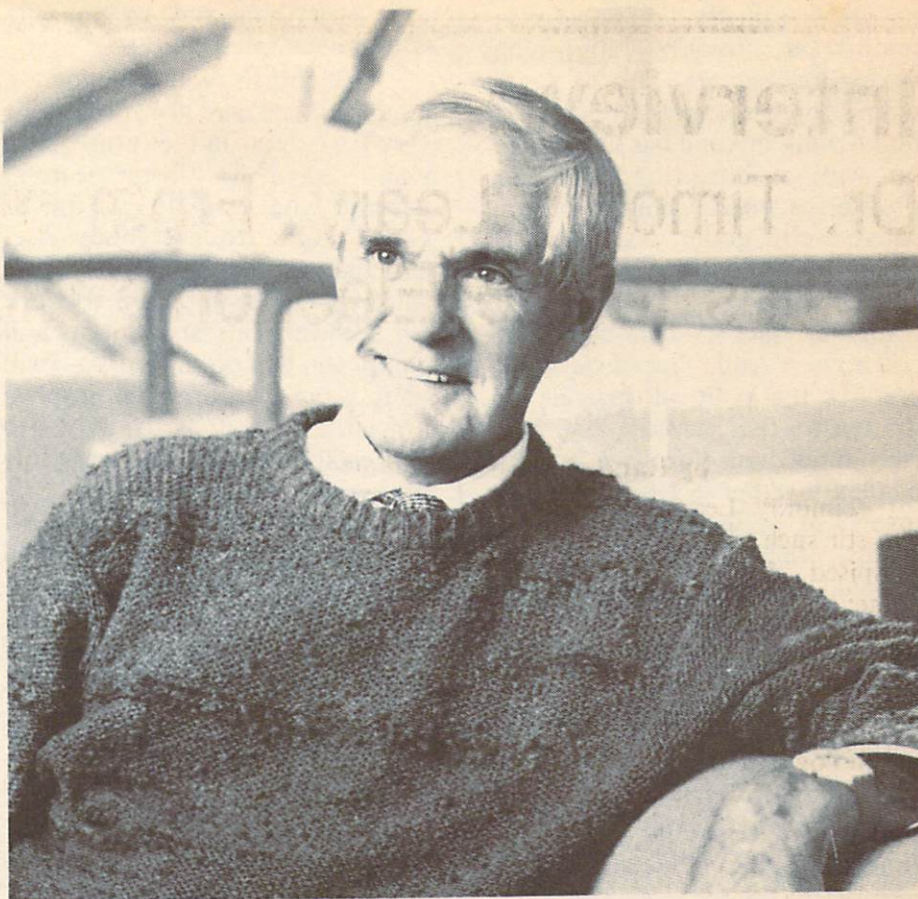
You don't have to do anything. You just have to keep your mind open and keep your door open and the genetic inevitability will swirl around you. I can't understand anyone from my generation, or from the 60's generation, who isn't being carried around by the same tide. You have to really hang on to the 60's and your Beatles records to avoid the 80's!

Randy: Do you think that there are large numbers of people out there for whom the world ended in '69, who are still sitting there, waiting for it to come back?

Dr. Leary: I know there are thousands of people, I know many of them, for whom Woodstock was the highest moment of their life. And they would just like to go back to that. Well that's just not possible.

Randy: What is the biggest difference in Timothy Leary today and the Timothy Leary in that 1966 Playboy interview?

Dr. Leary: I have gone through exactly the same changes that we've all gone through. I'm ten times more sophisticated; you are, too. I'm ten times smarter — you are, too. I'm a hundred times wiser, more experienced, but you are, too. The level of discourse has just been jacked up by a quantum



jump, and I've just gone up with the elevator.

Randy: As a philosopher, you look at the causes and effects of intellectual and social development. Turning that insight inward, who most impressed and influenced you?

Dr. Leary: James Joyce was my first adult model. He was a brilliant psychologist, basically fissioning paragraphs and sentences of our language and freeing the elements of communication, putting together, like an alchemist, new forms.

I was tremendously influenced by Thomas Pynchon whose book, "Gravity's Rainbow," I think, is the Bible of the information communication age. Naturally, it's underestimated and ignored, because it's so powerful, and because he won't play the game. You know, he disappeared. Nobody knows where he lives.

Recently, I have been tremendously impressed with and enriched by William Gibson, the Vancouver writer who's written "Neuromancer", "Count Zero", and "Burning Chrome". We all know that science fiction writers are predicting the future. Jules Verne predicted almost precisely where we would launch for the moon, and how long it would take. The science fiction writers have always been the forecasters and the advance planners of our species.

Now, what Gibson has done is to project our civilization 20-40 years into the future. Which is incredible, because you're still dealing with what's going on right now, the way "Blade Runner" takes Los Angeles and projects it into the future. There's no Obi-Wan Kenobi and there's no Force and there's no spaceships in Gibson.

It's simply nitty-gritty, mainstreet, lowlife, high-tech adventures set 20, 30, 40 years from now. It's perfectly relevant. I don't think anyone has ever come up with a blueprint that's so precise for where we are now and where we're going next. He has taught me a great deal.

Gibson's work is all based on computer hackers and computer cowboys. And he accurately predicts the political struggle of the twenty-first century, which is free individuals or free agents banded together in teams to overthrow, or at least to protect us against, the big AI, the multinational combines which already are controlling the planet.

So, Joyce, Pynchon, and Gibson. Marshall McLuhan is another person who proved to be influential.

Randy: You were, in many ways, one of the first and finest examples of McLuhan's media age celebrity.

Dr. Leary: People say that I invented "Turn on, tune in and drop out". It was actually Marshall McLuhan who triggered that off. He should get the credit, not I.

Randy: During that Millbrook era in the 60's, how aware were you of being under a media microscope with the world watching and judging your every word?

Dr. Leary: I was selected for that particular role as spokesperson by [Aldous] Huxley, and to a certain extent by [Allen] Ginsberg and by [Alan] Watts. They found me as a square Harvard professor, and groomed me for this particular role. Of the communication age, Andy Warhol said everyone's got to be a media star for at least fifteen seconds. I would take Andy's wonderful phrase and extend it. You've got to see yourself as a communications star, through your entire life. Since my first LSD experiences, when I sensed that we were in a communication

age, everything has to do with communication.

Of course you're under a microscope. There are going to be very few secrets in the future. You won't have to keep secrets, because what you do will be of great interest to everybody else. The major function in the future society — we're not going to work for each other because robots and computers will do the work — will be to serve each other, as inspirations or as stimuli or as models, to give each other examples and little pushes in the right direction.

You've got to define yourself as a media star in the future. You call yourself a worker in the old industrial civilization, but in the communications age you're a free agent. You develop your agency. You develop your skills in communication talents.

Randy: In the early 60's, our parents saw Camelot in the White House, with John, Jackie, and the kids. But, for many of their children, Camelot or Oz was to be found a few years later at either Millbrook, where you were, or in Fillmore West with Ken Kesey and the Grateful Dead. What memories do you cherish the most from that period?

Dr. Leary: The highest moments of my life are moments of growth, where you're slipping off the old snakeskin and moving into the next mode. Equally important are those moments when you sense that you are part of an historical event that's happening. Like, my God, you're there with Christopher Columbus, discovering this new world. And when you realize that you were part of an intellectual genetic historical movement that was going to totally change our species, as those great men and women did, the [Marie] Curies and the Max Plancks and the [Albert] Einsteins at the turn of the century. Feeling intense personal growth and participating in social and species growth. Growth

has always been the key to my high moments.

Randy: What role do you see the computer playing in the evolutionary process?

Dr. Leary: I believe in genetic determinates. I think there's a DNA plan for a species. It does exist — not blind. Adaption. There's simply no way you can explain our move from the water to land. There were thousands of anatomical, thousands of biochemical, and thousands of neurological changes that had to go hand-in-hand, to change us from aquatic swimming, gill-fed organisms to land-dwellers.

I feel that it was inevitable that human beings would discover the wheel, that they'd discover the plow. I think these events occur on all planets that have organic-based life. And I think that the emergence of information, communications, and a psychological civilization in which the mind is the power as opposed to the machine or to the muscles or the feelers was inevitable, and that it then should grow into electronics.

Randy: Why was this inevitable?

Leary: Because the universe and the atoms and the molecules are made up of electrons. We're simply discovering what happens to be there to begin with. But if that is true, you're going to have a neurological species with a brain of 100 billion neurons making a jump from a factory civilization where we are cogs in an assembly line culture. This is where we are going to become thought processors, thought communicators. You have to activate new circuits of the brain, and I feel that it was inevitable you have a psychoactive drug movement, and a total obsession with drugs on the part of the best, most advanced technological society, America.

America has been totally obsessed with drugs for the last 25 years. You turn on the evening

news and every other commercial is for Maalox, or for Excedrin, and on and on. Or, putting it another way, this is the golden age of chemistry. The golden age of chemistry produces all the chemicals, which we then use, which creates the golden age of Physics and leads to a very predictable number of steps.

Randy: What is the evolutionary link between the psychedelic revolution of the 60's and the silicon revolution of the 80's?

Leary: That the first generation of the communication, electronic age — born between the years '46 and '64 — has been weaned on information. They breathe information, they drag data from their mothers' breast, they have been dialing and tuning information all their lives. After all, Dr. Spock made them the demand-feeding generation.

When they got to high school and college, they were going to demand a wider variety of brain foods, namely drugs. I think it's totally inevitable that you have a drug movement which activates circuits of the brain, opens up new circuits of the brain, gives individuals the option of knowing that you can change your mood, change the acceleration or velocity of your thinking. This kind of movement prepared people for the personal computer. I think it was no accident that Jobs and Wozniak were long-haired, barefoot acid-toking hippies.

Randy: Going back again to that Playboy interview, in it you discussed your theories on the five levels of consciousness. Twenty years later, what progress would you have to report from the unknown frontiers of the mind?

Dr. Leary: I basically am a mathematical psychologist, and I like to work with stages and predictable levels. At that time, we defined five levels of consciousness, the fifth of which was

rapture, or sensual openness. The sixth level, which we developed in the 70's, was the electronic neurological level, where you're dealing with packaging and communicating thoughts not in terms of sensual stimulation, but in terms of electronic ideas — brain exchange. The next levels of consciousness and intelligence is going to be genetic, which I think is quite obvious.

“... I think it was no accident that Jobs and Wozniak were long-haired, barefoot acid-toking hippies ...”

Randy: You've described the psychedelic experience as an amplification of senses; as seeing more, hearing more, smelling more, an overall effect of increased awareness. What parallels do you see now as the home computer becomes a means of amplifying the users' senses and perceptions of the world around him?

Leary: I have a MIDI set up, Midi-Mate. It's very inexpensive, and, hooked up to a computer, it gives my 12-year-old son Zachary the equivalent of a multi-track studio. He can do “Mary Had A Little Lamb” on the tiny little synthesizer, store that, amplify it, extend it, throw in 100 violins, have it come back with banks of saxophones.

With the new graphics computers, the Amiga for example, you can pop a picture on there, then with your mouse you can move the eye of the Mona Lisa around, swirl it, start writing longhand with the top of the Taj Mahal — you can swirl and extend and augment optical stimuli.

We have the digitalization of sound, we have the digitalization of graphics, not to mention thoughts. Mind Mirror does the same thing with thoughts. You can take a thought about Ronald Reagan, spin it through a hundred other versions of Ronald Reagan, acrobatic, athletic, active, Armenian, down the line . . .

Randy: You said at the time that if you had the choice of giving a new power or energy to someone that was 15 or 55, that you'd invariably choose the 15-year-old, because he was better suited. What is it about that age level that makes them more receptive to either the psychedelic experience, or the computer revolution?

Dr. Leary: I based that statement on a very respected scientific theory of evolution. The tactic of evolution is called neoteny or juvenilization. Mutations can only happen in a species with the pre-adults. The word adult, by dictionary definition, is the past participle of the verb to grow. When you are an adult, you stop growing. It's a straight nuts-and-bolts method of evolution. It has to work with the juveniles of the species.

For example, when we split off from the dinosaurs, it was not grown-up adult dinosaurs with their clanking, FBI boiler plates, that were involved; but rather, it was the teenage proto-dinosaurs that said, “Hell no, we won't go.” Evolution in the universe can take place only in juveniles.

No individual human being or group can do anything to either accelerate or to slow down evolution. When it's time to backbone, it's gonna backbone, whether you're for or against backbones.

I've been criticised and I've been adulated and flattered, by those saying that I either did or did not create a drug culture. This is ridiculous. The drug culture was inevitable. It was present when we started climbing out of the water

— we've got an oxygen culture. I cheered it on; I said, "Yeah, if you're going to live out of the water, toot oxygen." But, I take no credit or blame for that. It was going to happen

Randy: What longterm evolutionary impact do you see the computer having on the children growing up in this world of home computers?

Dr. Leary: It's awesome. The law of neoteny, it's also called paedomorphosis, nice word — look it up in the dictionary — is that if you want to bring about changes in the species you have to work with the young.

When we Spock parents gave our kids television in the 50's, that was a profound evolutionary step. We created the electronic consumer society. When we are giving our kids computers, we are unwitting agents of another profound evolutionary step.

The law is this: the more power we give to the juveniles, the faster the species will evolve. And by giving 17-month-old kids computers, you are just pushing the rate of acceleration up higher.

Randy: Do you think these children are just going to be more advanced than the previous generation, or are they really going to think differently? What impact on the actual thought processes of this new generation do you foresee the computer having?

Dr. Leary: We'll see an extraordinary change. I'm convinced that the intelligence level of individuals, a culture, or a species is determined almost exclusively by the technology used to package, store, process, rearrange and communicate thought. You have the oral tradition, you have the hand/thought papyrus tradition, you have the mechanical assembly line mass-produced book/Gutenberg tradition, and now we have the computer to package thoughts, process

thoughts, store thoughts, retrieve thoughts, et cetera.

This will create an entirely different species. Just as we had to have different forms of food and water when we climbed from the water to the shoreline, information is now our air, our water, our food — it's brain food.

We were, years ago, a muscle species out there with a plow. Then we became a mechanical species, appendages of the machine. Now we are becoming a thought-processing neurological species. We're just as different from the factory civilization as the factory civilization is different from the most primitive savages in New Guinea — they're just going to be different in every way. We can predict, I think, with crystal clarity the next steps and stages in evolution.

Randy: What do you foresee as the next major technological level in this evolutionary process?

Leary: Your three-year-old, I predict, by the time he is 10 or 15, will be involved in direct brain-computer linkup. We've already seen that in some of the bio-feedback stuff which, by the way, Commodore has done the most with.

The next step in these primitive biofeedback forms, is direct computer-to-brain linkup. Now that means we're going to be communicating brain-to-brain, using the computer as a switching device, or a reflecting device. That's a different species. We're now approaching scientifically what's known as telepathy. It's not the magical mind-reading stuff. It's bouncing information from my brain to your brain without words or without literal thoughts.

Randy: In this new electronic generation do you see the computer programmers playing a similar trend-setting role as the rock stars of the 60's and 70's, or

the great movie stars and writers in the 40's and 50's did?

Dr. Leary: I surely hope so. I have many projects going, but they're all centered around the notion of celebrity software. I think that the people who design, program the graphics and sound processors, should become stars in the sense of models and examples for the new generation of communication athletes.

In my next programs almost all the friends that I have in the media business are going to do walk-ons and appear in my programs, to give you a sense that a 12-year-old, 16-year-old, 80-year-old kid can be interactive with the Beatles.

That's celebrity software in the sense of your living out the lives of celebrities. But the next step is making stars of the designers. But in order to do that, they've got to come out with the new software, and they haven't done it yet. There's an *enormous* vacuum; I think it's a vacuum which is indescribably large. The consumer market will be literally a thousand times greater than the current market when the software is available.

Randy: It's similar to the state of the recording industry in the mid-60's. The technology was there but it took Lennon and McCartney to unleash the creative power of the hardware. One of the additions the Beatles made, one which I also see in Mind Mirror, is the element of humor.

Dr. Leary: Well, I believe that humor is another key to evolution. Unless you can laugh at yourself and your species — in any situation — you're not going to change it. I think humor is the compassionate way of criticizing yourself and others.

I may be wrong, but I feel that many, perhaps most of the people who have been involved in the first generation of the personal

computer are lacking sense of humor. They're so driven, they're so obsessed with the thrilling frontier they're on that there's a certain lack of sophistication. And, I think, as you said, there're thousands of sound studio geniuses creating this wonderful technology, but it took those four kids from Liverpool with that satirical sense to come in and do it. That's why I'm inviting people with sophisticated, funny minds to get in and use the technology.

Randy: What impact do you see interactive fiction, or adventure games, having on the art of literature?

Dr. Leary: I think that's an evolutionary event as profound as the Gutenberg phenomenon, when people were not being told what's on the mainframe by the monks, but could actually hands-on read and write themselves. I think we have just begun to tap interactivity. I think the parser-driven programs are puzzles, rather than books. At least the reader is involved in solving the puzzle. That's a step in the right direction.

On the other hand, the sophisticated reader doesn't want to spend eight hours struggling with a Babelfish. They want to move faster. The puzzles *must* be more mobile. The first generation of electronic readers would sit in front of the computer for a hundred hours to play one game, and delighted in the difficulty. In a sense, that sounds like a New England, East Coast, Infocom phenomenon — they like to be frustrated.

I think the next generation of interactive literature is fast-moving, where instead of puzzling for hours, you're going to have seven or eight menu-driven choices a minute. You're moving your ideas around. And you can play it back just like a baseball game or a basketball game. You're running up and down the court with the author-designer and you're getting

scored as to whether you hooped a basket or not, or if you go out of bounds.

Randy: I'd like to explore some areas that aren't directly related to computers, that are more related to Timothy Leary. Many of my generation were reared as Spock kids, only to graduate from Dr. Spock to Dr. Leary in our teens. Any comments you'd share with us on Spock?

Dr. Leary: Yes, I was taught by Spock — I was a Spock parent. But Spock couldn't help after his kids got to high school. He was a pediatrician. He did not understand; even in his own personal life, he did not know how to deal with his *own* sexuality. He did, by the way, at the age of fifty break loose and found a new adolescence, for which I give him great credit. But, yes, I took over from Dr. Spock when his kids got to high school and college, and just kept saying what he taught me to say. I'm a total follower, a robot follower of Dr. Spock.

**“... If Buddha and
Christ and Mohammed
were alive today,
they'd have talk shows
...”**

Randy: Over the course of the years, you've been in a lot of unique situations, including spending a fair amount of time as a guest in a correctional institution. What kind of impact did the time spent in prison have on your philosophies, and what sort of insights and perspectives did you gain from that environment?

Dr. Leary: When I was put in prison in the 70's, I knew I was exactly where I had to be to follow my profession. As a child, I

studied the history of philosophy and I realised that every successful philosopher has shot his blasters to shake up society with innovations, to challenge the orthodox ways of thinking, and for that there's only one reward — if you're lucky, it's jail, if you're unlucky, it's the stake, or Siberia, or a cross.

When I got to Harvard, I *knew* I had to be at Harvard. This is where I was supposed to be. I knew I wasn't going to last there. I knew I had to get kicked out of Harvard. When I was in prison, I knew I had to go through that stage and show that I wasn't afraid of it, they couldn't shut me up. I wonder about any philosopher who hasn't done time for his or her ideas. I hear people sounding off about society, and about philosophy, and I wonder, “Would you do time for this?” “Are you for real?” “Or, would you cop a plea?” So, it was a sense of arrival. Thank God, I'm here.

I remember very well the day I was captured in Afghanistan and brought back to Folsom Prison, which is the worst prison in California. Within Folsom Prison is the adjustment center, which is the worst circle of Hell. And in the adjustment center, where you had the baddest, most wicked, horrible, dangerous men in California, there was a hole in the bottom of it, and I was there with Charles Manson and a book. I had arrived. There's only one way to go from here. Up. And so, there was a sense of, “Well, thank God this happened now, we can get to the end of it and get on with the next act of the adventure.”

Randy: What impact did your celebrity status have on the way you were treated as a prisoner?

Dr. Leary: Most of the prison guards and the administrators with whom I dealt respected me; most of them even liked me. And most of them said openly, “You're a political prisoner.” So,

I was given a certain respect and a certain slack there. Also, they had to protect me. If anyone had run numbers on me, it would have reflected badly on them.

Also, you see, I demanded that. I had not one shred of guilt, because I was not in prison for anything I had done wrong. I was in for stupidly letting them plant a couple of marijuana joints on me. I should have been a little smarter. But, I had no guilt, and they recognized that. You can't hide anything in a prison. You can't have any secret neurosis, or any secret weakness or they'll find it out. So, I just simply demanded that respect. And if there was any guilt, it was guilt on their part, because they knew I shouldn't have been there. I had dozens of prison guards and supervisors come to me and say, "You shouldn't be here."

Randy: From your perspective, what do you think is historically the most significant event that you've watched transpire in the evolutionary process over the last sixty years?

Dr. Leary: I saw the birth of a psychological welfare age of the 30's and 40's. I saw America reach its position of total imperial power. I saw the birth of television, and individual appliance electronics. I've seen the end of the industrial age; the deserted streets of the milltowns in Pennsylvania. Boy, it's so hard to pick out one.

Randy: As a philosopher, do you feel that one could one be singled out as having more impact on the future than the other; or are they all interrelated like a string of falling dominoes?

Dr. Leary: They're all interrelated. When we moved from the water to the shoreline, there were thousands of chemical hormonal changes, thousands of anatomical changes, thousands of neurological changes that had to

take place together. You couldn't have any of these events without the other — see, I'm a nuts-and-bolts person, and down at the level of machinery, they all go together.

The availability of electronic sound applications made possible Dylan's singing the song. he couldn't work on Maggie's farm no more, which is the classic metaphor of the post-industrial kids: "We're not gonna work in General Motors' factory no more." They had to go together. To have Dylan you first had to have a technology in which you had millions of inexpensive portable electronic receivers, cassette sets and record players.

There were enormous psychoactive drug movements in the past. There was the movement in nineteenth century England when every poet was on laudanum. There was an enormous cocaine and heroine binge in America in the late nineteenth and early twentieth century. But there was no electronic communication — we didn't know about it. We didn't know that some of the greatest philosophers were actually changing their minds and expanding their brains through drugs. It was the electronic communication net that made possible the enormous burst of energy we called the 60's. It all goes together, at least so it seems to me.

Randy: Lewis Carroll didn't have the advantage that Timothy Leary did of having Walter Cronkite on the evening news reporting what he'd done today.

Dr. Leary: Yes.

Randy: While we're talking about the media, you've been on both sides of the coin, so to speak. You, and possibly Dylan, were the first, dare I say, "pop philosophers," to utilize the media effectively.

Dr. Leary: I love the word pop! Yes, I want to be a pop philosopher. Because pop means populus. Pop means people. A

pop philosopher is one who's a philosopher of the information communication age. If Buddha and Christ and Mohammed were alive today, they'd have talk shows. They'd *have* to deal with interviews. They'd have to know what to say.

If you're going to do the Sermon on the Mount today, you're going to have to know how to get your signal out with audio-visual graphics and multi-colored dimensional form to attract and entertain. Entertain means, of course, simply get into contact with.

Randy: Confucius in a Donahue setting?

Dr. Leary: Absolutely! And also, the word "pop" is a derogation to a person of the factory civilization. It means that you're a hot dog, or you're not putting the nuts on the bolts and doing your duty. You're trying to get attention to yourself; you're trying to blow your own horn. Well, of course, you can't do that in a slavish industrial society. You've got to just put the rivet in the car. But, "pop" is the key to the information communication psychological age.

Randy: Having been in many ways a self-made product of the media, what role do you feel the media should play in this evolving age of communications?

Dr. Leary: The media should do whatever it wants, without any censorship. That's so simple. The media can do whatever it wants. Then that means we can, too. We're all media.

So let everyone send their message out; let everyone print their book; let everyone send their signal. You don't have to listen to it. You don't have to buy it. But you can't censor it. You can't have any laws restricting the freedom of information. That's so obvious. You can criticize me — that's fine. I can defend myself. I can criticize you if I want to. That's the name

of the game. In an industrial society or feudal society, sure, criticism is either treason or heresy.

Randy: Speaking of heresy, why is there so much resentment on the part of traditional psychologists toward people like you and Joyce Brothers who are out there interacting with people instead of charging \$90 an hour? Is it economic? Is it professional jealousy, or fear, or just insecurity?

Dr. Leary: This is totally predictable. When you move from one civilization to another, people are put out of work. When you went to a machine age, the horse trainers, the saddle makers and the carriage makers were put out of work. Psychologists from the industrial age, who got a degree and set themselves up in a profession which has rules and regulations and bureaucratic protections, they're simply out of a job.

Orthodox psychologists are in despair. They're going to fight with the last drop of their blood against the new. I have great sympathy for psychologists who despise and hate the pop psychologists. It's like the steel worker in Pennsylvania. He says, "My father killed himself. My brother killed himself. We're out of a job." He's mad, he's upset, he's terrorized. What do you say? "It's all over, baby. It's not our fault." We can understand it, we can sympathize with it. I truly don't want to get in the way of their vengeful power. But, that's happened throughout human history.

Randy: How would you respond to their charges that pop psychology is harmful? Critics allege that such noted people as Ann Landers and Joyce Brothers are dishing out cliches, and people are buying that rather than going to get the help they really need.

Dr. Leary: One thing about psychology, it's the most

mischievous and malicious of all the professions, because there's no feedback. Psychology has no way of keeping score. It's like the game in "Alice In Wonderland" where you're playing croquet and people are moving around and changing the rules all the time.

These critics would say, "Oh, yeah, Landers and Dr. Brothers are dealing out cliched bromides." But at least we know what they're doing. We don't know what they (those critical psychologists) are doing inside their consulting rooms. I shrink to think of the bromides that the average analyst's giving out about "you love your mother and hate your father". That's the repetitious cliché nonsense that's handed out in a *more* dangerous way, because, in the sanctity of the consulting room, or in a hospital, you get all the appurtenances and trappings of authority — medicine and prestige. At least Dr. Brothers and Dear Abby are just out there tap dancing where we can look at them.

Randy: They're publically accountable for what they're doing?

Dr. Leary: Yeah. You can disagree with that. A third of the time you'd say, "She's full of shit," and a third of the time, "Hey, that's kind of interesting," and a third, "Just dull." But at least you react to it. There's no way you can react to the other.

Philosophy and psychology are the two most bureaucratic-bound, ridiculous professions. It's ironic, because they're the professions that are going to take over the information age. The information age is basically psychological and philosophic.

Randy: Do you think it would be fair to say that a lot of real psychologists are probably more involved in politics than in therapy?

Dr. Leary: Well, Hooper ratings, opinion polls, and all marketing is

applied psychology. The military discovered psychology first in World War II, and then industry discovered psychology. And advertising followed.

It's advertising that has developed the most interesting stratifications of American society. You know, the VALS, the values and lifestyles questionnaires. They're isolating different consumer groups in society. They're way ahead of psychology because they have to produce. Industrial psychology is more successful because you see whether your campaign is selling more soap, or selling Reagan, more effectively than mine may have been.

Randy: What advice would you offer to help people come to grips with life in this new age of electronics?

Dr. Leary: I'll have to go back to my old romance. There's only one piece of advice to give anyone: Wise up! Don't you see what Reagan's doing besides selling you lies? Wise up. Don't you see what the Democrats are doing? Wise up! That's the unfailing protection of a human being. You just smarten up and see what's going on, and you can avoid it.

Randy: Psychologically, how do you explain the fact that most public opinion polls show that the majority of Americans disagree with the majority of Reagan's policies, but yet the majority of Americans believe in the man and support him?

Dr. Leary: There are a lot of factors there. One is that Ronald Reagan's not just a successful communicator and a likeable, attractive public figure. He's also allied himself with the most ruthless, powerful political machine: the right wing, the military, the really far right religious, cowboy side of the Republican party. These guys know how to swing a vote.

The way that I understand the Nicaragua controversy, the majority of Americans don't want to give a hundred million dollars to the country; but Reagan knows how to twist arms and how to use lobbying, favors, and threats to withhold campaign funds, not to mention the blackmailing that these guys do to coerce a vote. So it's not just a media, pop, happy, jolly Ronnie. It's a ruthless machine.

I compare the Republican party in ruthlessness to that of the Soviet Communist party. The Communist party is worse, only because Americans won't let the Republicans get away with what the Russians do. But the Meese wing of the Republican Party, if left to its own devices, would lock this country up just the way the Soviet Union's locked. There would be no individual thinking,

no privacy, no open dialog. And *certainly* no criticism of them.

Randy: You endorsed George McGovern in '72. How did that come about?

Dr. Leary: I was in Switzerland at the time, and Allen Ginsberg wrote me and phoned me and asked if they could use my name. I said, of course, you can do anything you want, Allen. But that's suicidal. The last name in the world I would use in the 1972 election would be mine.

That '72 McGovern election was actually won by the hippies because they scared Nixon, even though all the polls said he was going to win by an overwhelming landslide. Because of the groundswell of youthful dissent, Nixon got into a state of siege mentality and then unloosed the plumbers. Totally irrational, because in his

heart he knew he was going to lose. In his heart he knew that you can't oppose 76 million young Americans. He blew it. He should have just kept cool and he wouldn't have had to call in Liddy and Watergate.

Randy: Getting back to Mind Mirror, what advice would you give to the person sitting down to use the program for the first time?

Dr. Leary: This is a very primitive device. Think of it as the Wright Brothers' first plane. It will allow you to digitize your thoughts and learn how to expand and change your thoughts, and communicate them accurately to other people. It's a very primitive thought processing device.

It's the first time anyone has ever developed an electronic device for plotting your thoughts as they move. In the simulations

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mode, there are over 3000 micro events, that are mini-movie scenes. You're playing yourself, or you're playing your ideal, or you're playing Ronald Reagan. And every time you make a choice, that choice, that thought movement is plotted on the screen. Now, life is a menu-driven reality. And every minute of your life, you're moving through space-time, left-right, up-down, north-south. Once you get this feeling for how Mind Mirror works, you'll be in the driver's seat of your own mind. It's a scientific boon.

Randy: How receptive do you think the average person is to really evaluating their own thoughts?

Leary: I've been shocked to realize that there were a lot of people out there who don't want to know what they think. I had a great shock in the 60's when I realized that a lot of people didn't want to have psychedelic dreams, didn't want to expand their minds, and didn't want to get to this higher level.

Mind Mirror allows you to see what's on your mind. Of course, I'm shocked again, because most people don't want to know what's on their mind. The last thing in the world they want is to face themselves in the mirror of their own thoughts.

I'm overjoyed with the fact that this is the first means of communicating your holograph or your digital thoughts. Your friend and you can see on the screen exactly how you differ. But how naive can I be? Most people don't want to let other people know what they're thinking. As a matter of fact, 90 percent of human communication is bluff and deceit and camouflage to keep people from knowing what you really want. So, once again, Mind Mirror is a little ahead of its time. On the other hand, truth is always kind. Truth is always beneficial. I know it goes against the whole grain of Chris-

tian and Islamic cultures to say that.

Randy: Can you give us some insight into the new software projects you have underway?

Dr. Leary: I have attained the software rights to a book called "Neuromancer" by William Gibson. "Neuromancer" in 1984 won the Hugo, Nebula, and Phillip Dick awards. It swept the Triple Crown of science fiction. I've already described Gibson's genius in projecting a future maybe 20-40 years ahead. The readers of Gibson's books are going to be living in the world that he's outlined. It's not Obi-wan Kenobi. You're not spinning around galaxies. It's taking place. You're going to live that.

Gibson is working with me on the program. The movie rights to the book have been sold. The man who is writing the screenplay for "Neuromancer" is a man named Earl MacRausch, who wrote the screenplay for "Buckaroo Banzai". I'm sure most computer owners know about "Buckaroo Banzai". We're getting a very interesting set of minds, a writer like myself, a screenwriter, and a book writer are kind of working together, and the screenwriter is going to play off, to a certain extent, what I do in the program.

Also, William Burroughs has agreed to help me on the software, so we're bringing in one of the top avant-garde writers. Keith Herring, who is the top artist of the twentieth century, is going to do some of the graphics for it. So, together, we're building a mind movie, in which we're bringing together some of the top talents of our time, to develop and produce a "performance book".

Randy: You've talked about the limitations of Mind Mirror. What's next on the psychological software front?

Dr. Leary: Head Coach is the next product after Mind Mirror. Head

Coach is almost scary, because you can add any attribute. One of the attributes that I use in my life is "Uncle Homer-ish", a rich Uncle Homer. Uncle Homer was flamboyant, he was funny, he was rowdy, he was elegant, he was cosmopolitan, he was dishonest, he was the one that bounced all the checks. So all through life, I check other people on this dimension of how much they are like Uncle Homer. If you're too much like Uncle Homer, I know you're going to bounce a check on me. So, I might cool it.

I've created an attribute there that's totally individual, totally customized and personalized for me, that I can show to you to see what you've learned about me. You realize that we're here talking and all the time I'm looking at you to see how Jewish are you, how gay are you, how Uncle Homer-ish are you? God knows the measuring skill that we have in our minds.

Randy: You're saying that Head Coach will allow the user to measure others by their own psychological yardsticks?

Dr. Leary: Head Coach allows you to take any attribute that you want and use it to caliper and scale any other thought. When you put these thoughts together in new molecular combinations, in Mind Mirror, these variables nearly always go together. You're frozen in the mind mass. Bio-energy, interpersonal creativity, social sophistication. In Head Coach, you can put Reagan on the screen and flip through hundreds and hundreds of variables measuring Reagan. You and I can do it and we can see exactly where they come together. The computers decide. Well, of the thousand attributes that you've used to compare Ronald Reagan, in 33 of them you're in total agreement, and in 33 of them you're in total disagreement. You see immediately.

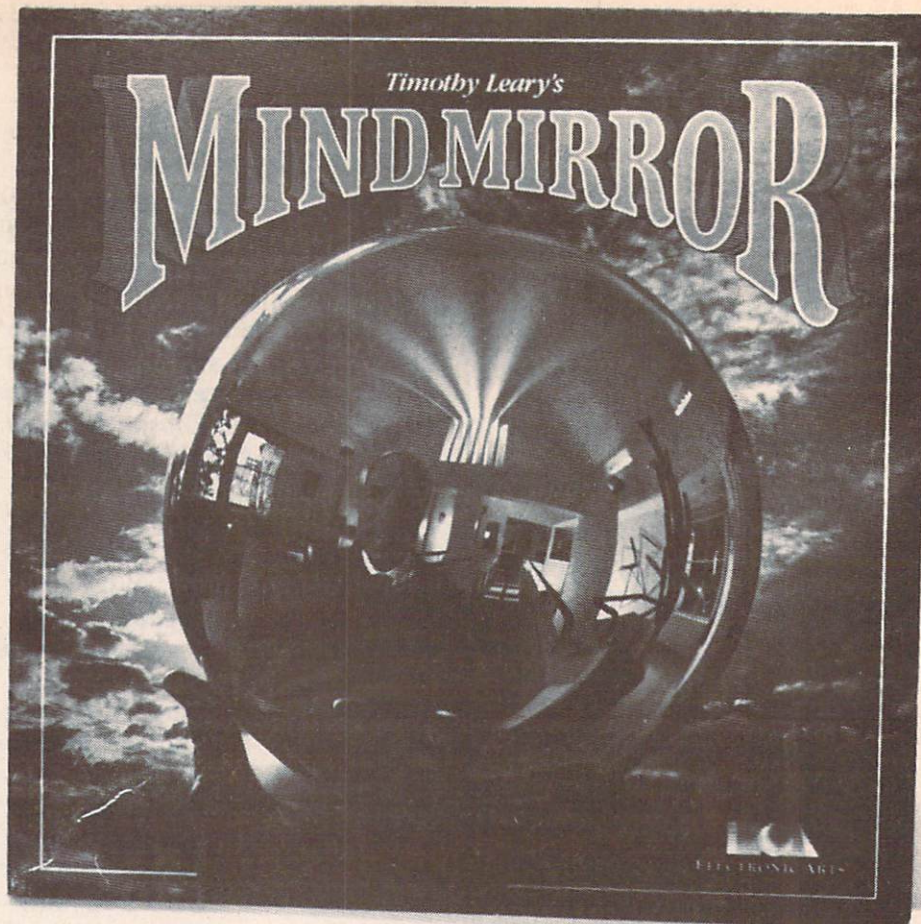
In the height of evolutionary or psychological experiences, there are moments when your mind is moving so fast that your thoughts leave vapor trails. In Head Coach you keep your hand on the advance button or on the space bar as though you were going through the filing cards of your mind, watching all these thoughts about Ronald Reagan or about yourself, and how we agree or disagree. And at any moment you can have it programmed so that wherever you get to a real disagreement, stop. So, that's almost scary, in the sense that we are giving people an appliance to scan your thoughts in a totally innovative way.

Randy: Would you recommend that these tools best be used alone, or with others?

Dr. Leary: Mind Mirror is basically an appliance for communication. Sure, I can put my own thoughts about myself and my world down there, but the real fun comes when two or more people sit down in front of it. I predict that if anyone takes Mind Mirror and has two or three of their friends come in, within five minutes you're discussing the differences. You're discussing the discrepancies. You're discussing anthropological and physiological and philosophic issues. You're laughing. You're arguing. If you and I disagree on one dimension of your thought and my thought, that's no final judgement. You stop and you can talk about any one of these discrepancies for a half hour. It's the first tool for clear mental communication that our species has ever developed, as far as I can see.

Randy: One of the applications that I found very fascinating in Mind Mirror was one of the suggested applications, comparing your spouse with your ideal lover.

Dr. Leary: We call that the Marvin Mitchelson special. He's a great



divorce lawyer. A husband and wife come, and the husband does his wife as he sees her, and the ideal wife, and the wife does the same thing, how she sees the husband and her ideal husband. Well, immediately it's, "You mean, you see me that way?" and "You mean you'd like me to be this way?" That can be very, very steamy and smokey. Because, basically, there's nothing more exciting than mental intercourse. Even if you're having physical intercourse, the physical intercourse between people is valuable only to the extent that the mental is there. Otherwise, you're just humping robots.

Randy: Both politically and personally, what is the single most important piece of advice you would give someone as they prepare to deal with the 80's and 90's, and the next century?

Dr. Leary: My advice has always been the same. TFYQA. Think For Yourself, Question Authority. There's no way you can get around thinking for yourself. If you're a member of Homo Sapiens, it's your genetic duty; just like scorpions sting and dogs bark and hens lay eggs, human beings think. By definition. Homo Sapiens Sapiens. Thinking for yourself. And questioning authority is the key to evolutionary change. You've got to question your own authority. Question everything. Not in a negative way, or not in a hostile way. But, Think For Yourself, Question Authority is the motto of our species, the motto of evolution. And it's also the unfailingly successful blueprint for running a personal life. It just works all the way down the line.

The Guide's 1986 Best And Not-So-Best Awards

by The Editors of The Guide

The flashlights are illuminating a three-foot diameter glimmer on the sides of passing pedestrians. Economy cars and one Volkswagen van are pulling up to the curb. Tennis shoes are padding up a red carpet that was vacuumed especially for the occasion. Dozens of excited fans line the sidewalk, yawning. The media push their way past a boisterous onlooker as they head to the nearest take-out donut shop. You can feel the electricity in the air, if you can get a finger in that little slot on the socket.

IT'S TIME FOR THE GUIDE TO COMPUTER LIVING'S 1986 BEST AND NOT-SO-BEST AWARDS!

Inside the vast auditorium, the thousands of richly upholstered, empty seats surround four men nattily attired in their black tie T-shirts, sipping the finest generic beer: the editors of The Guide. Their excitement is running high because they know this is the time

that they get to pay homage to the best and brightest in the computer industry, not to mention the chance also to raise havoc with the underachievers of the business.

But wait! It's time for the ceremony to begin. The band begins to play and the needle skips only once as it drops into the groove. The house lights dim quickly as someone reaches for the wall plate. And the celebrity host, Kartoon Calvin, who walked across the street directly from his kiddy show to collect minimum wage, trips onstage.

The crowd is hushed. Only the pop of a pull-top breaks the silence as Kal begins the roster of honor.

So, here they are: Our favorites for 1986. The people and programs (seriously) that the editors of The Guide to Computer Living saw as the outstanding achievements and the memorable bummers of the year.

And the winners are . . .

Product Of The Year

Product Of The Year

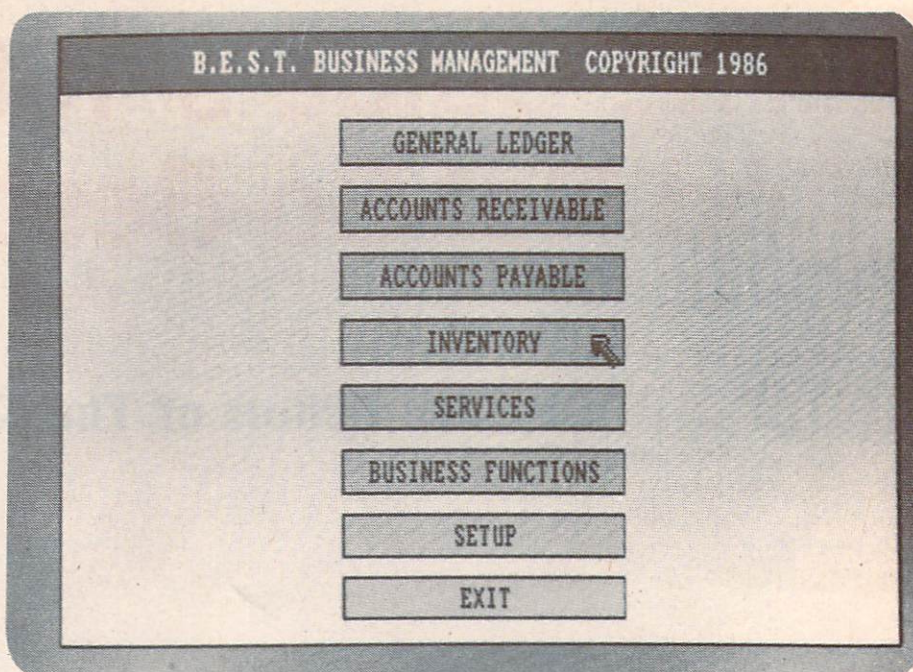
Business Management

Business Electronics Software & Technology, Inc. (B.E.S.T.)

In a year that's seen many exciting and interesting products, we collectively cringed and shuddered at the prospect of singling out one product as the most significant of the year. Among such possible choices as **Deluxe Paint**, **PaperClip II**, **GEOS**, **Hacker II** and **Defender of the Crown**, it is an imposing task to select any one over the others.

Surprisingly, when we sat down to make the final selection, it proved to be easy. Only one product, in our minds, stood above all others in advancing the state of the art, and only one product held the potential to alter radically the nature of software design in its genre. It's ironic that the product is only just being released as this issue goes to press; but the impact is going to be significant enough to warrant award Product of the Year to B.E.S.T. (Business Electronics Software & Technology) for their long-awaited Business Management for the Amiga.

Not only do we believe this program sets new standards for accounting products on *any* computer, we also think that B.E.S.T.'s Business Management (BBM) will be the first product with the power and potential to successfully push the Amiga into that *real* computer market that has remained beyond the reach of Commodore's marketing strategy. BBM provides a truly integrated accounting system *and* management tool for businesses, big or small, and does so in the friendliest manner imaginable for such a *serious* program. B.E.S.T.



has created a professional application so alluring that it will give even IBM owners a reason to seriously consider purchasing an Amiga.

In this most ambitious Amiga application to date, B.E.S.T. has created a menu-driven package that not only covers all traditional accounting processes, but operates in a revolutionary job-oriented structure. For the first time, accounting truly is left to the computer and the user is freed to focus on the day-to-day activities of his business.

Designed with an unprecedented combination of simplicity and versatility, BBM transforms the Amiga from a state of the art graphics machine into a super-powered business tool. With the minimum system configuration of a 512K Amiga and one disk drive, BBM will easily handle the

capacities needed by most small businesses and with a hard drive added BBM will run even a *very* large operation. With an upgrade of BBM that will address expanded Amiga memory available directly from B.E.S.T., the data capacities are staggering beyond belief for a computer that sells for under \$1500.

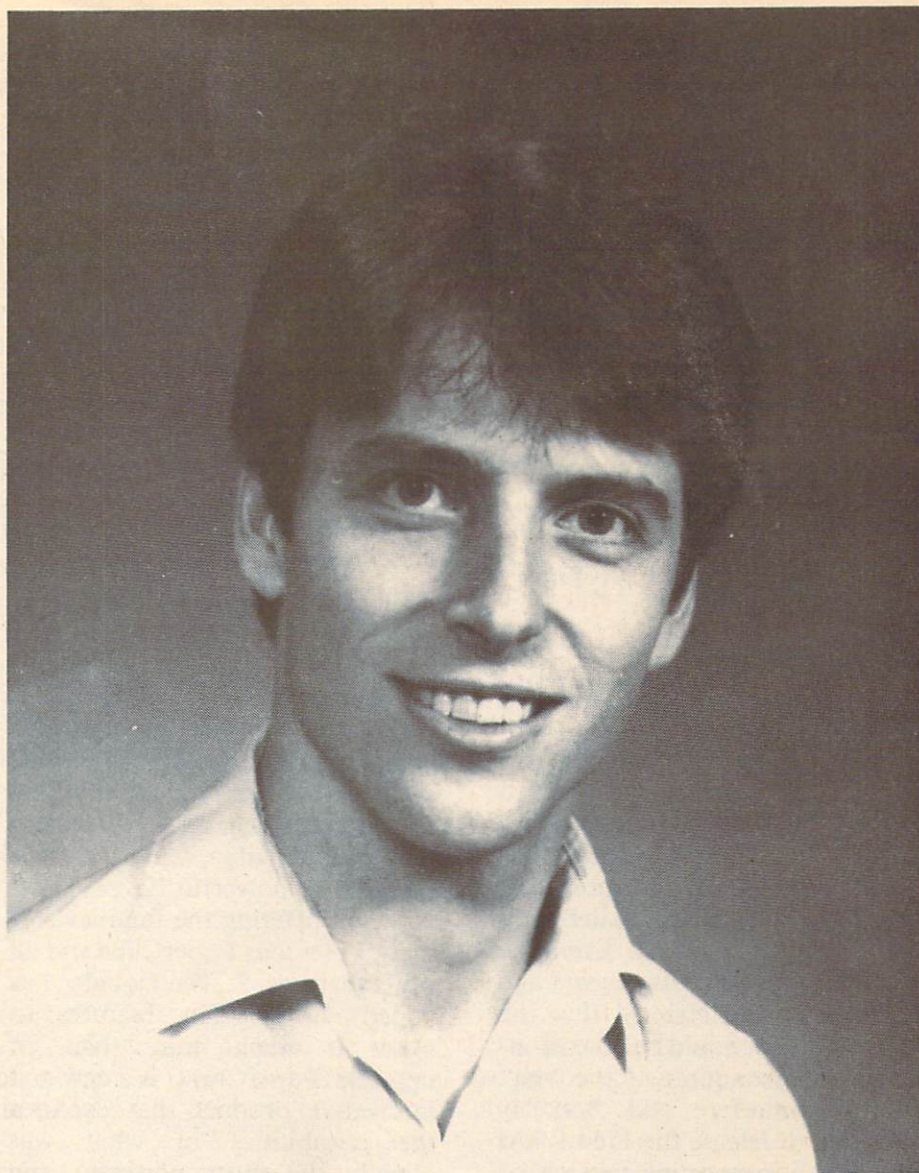
BBM covers the accounting basics, General Ledger, Accounts Receivable, Accounts Payable, Inventory, and Services (repair, rental etc.). The software is a totally integrated package on one disk. The mouse-driven, menu-guided user interface focuses primarily on task related work screens. Rather than posting Accounts Receivable journal entries, the user follows simple menus with the click of the mouse to perform understandable daily routines such as invoicing customers, receiving payments, is-

suing purchase orders or writing checks.

The BBM disk contains a 220K program in compiled C that consists of over 1000 separate programs, all blended expertly and efficiently into one integrated software system. While the entire system surpasses the memory of a 512K Amiga, the use of disk-based overlays gives the user almost instant access to any part of the program. In mere seconds, the user can jump from printing custom-designed inventory reports to adjusting entries in the General Ledger.

The deciding factor in awarding BBM the top honors for 1986 was the fact that it dwarfed accounting products available for bigger more expensive computers. To buy just one module for most IBM accounting packages costs most than the \$395 retail of the entire B.E.S.T. system. With BBM, the Amiga suddenly becomes the business machine bargain of the year.

For both their ambition and execution and also for stepping forward with a potent statement of support for the Amiga as a *serious* computer, we commend B.E.S.T. for showing the world just how productive The Amiga can be.



Programmer Of The Year

Programmer Of The Year

Bob Fisher

B.E.S.T. Business Management

Our list of contenders represented the cream of the crop in a talent-laden industry. The nominees shared the distinction of creating a program that made the top of our list in one category or another.

But finding common grounds on which to base comparisons wasn't easy. How do you fairly judge merits of a word processor

on the 128 with a conversion of an arcade game on the Amiga?

While each of our nominees is deserving of recognition, we made our selection based on a variety of subjective judgements. How ambitious was the project? How innovative was the approach and the execution? What kind of impact will the programmer's efforts have on the industry itself?

We also tried to focus on products that were primarily the work of an individual programmer,

although aided by varying degrees of support from within the company involved.

Weighing heavily the impact of the product upon the marketplace, the innovative approach and quality of the execution, and the fact that it was the most comprehensive programming task completed by a single programmer, we've selected B.E.S.T.'S Bob Fisher for our Programmer of the Year. A relative unknown in the Com-

modore/Amiga world, Fisher makes his Amiga debut with our pick as Product of the Year, B.E.S.T.'s Business Management.

Our finalists for the award included: Dan Silva, Deluxe Paint (Electronic Arts); Steve Cartwright, Hacker II (Activision); Bob Lentini, BobsTerm Pro 64 and BobsTerm Pro 128 (Progressive Peripherals); Steven Douglas, PaperClip II (Batteries Included); and Larry Reed, Marble Madness (Electronic Arts).

Fisher, our Programmer of

the Year, was responsible last year for the B.E.S.T. accounting series on the 64. After over 1500 hours of work, his Amiga Business Management package was shipping as we went to press.

Asked to define the philosophy behind this innovative approach to accounting software, Fisher responded, "We were trying to develop more than just an accounting system. In trying to help a person manage his business more effectively, we tried to design a system interface that

allowed the user to deal with the things that he's familiar with. For instance, issuing purchase orders or invoices drives the accounting. Using a business function menu to drive the system greatly simplifies the system for the user."

Our choice of Fisher as Programmer of the Year was made for the unique design, the quality execution, the ambitious scope of the project, and for the impact we see the product having in enhancing the future of the Amiga.

Application Product Of The Year

PaperClip II

Batteries Included

It was a good year for application software, with the industry taking significant steps to unleash the underutilized productivity of both the 64 and the 128. GEOS was one of the most ambitious projects ever undertaken for the Commodore 64. Everyone would have laughed two years ago if someone had claimed that the 6510 processor could be coaxed into an impersonation of the Mac. Had Commodore and Berkeley managed to release the 1764 RAM disk and a supporting version of GEOS, the combination would have forced its way to the top of the list. However, the speed problems inherent in a disk-based operating system utilizing the 1541 continue to inhibit the value of this product.

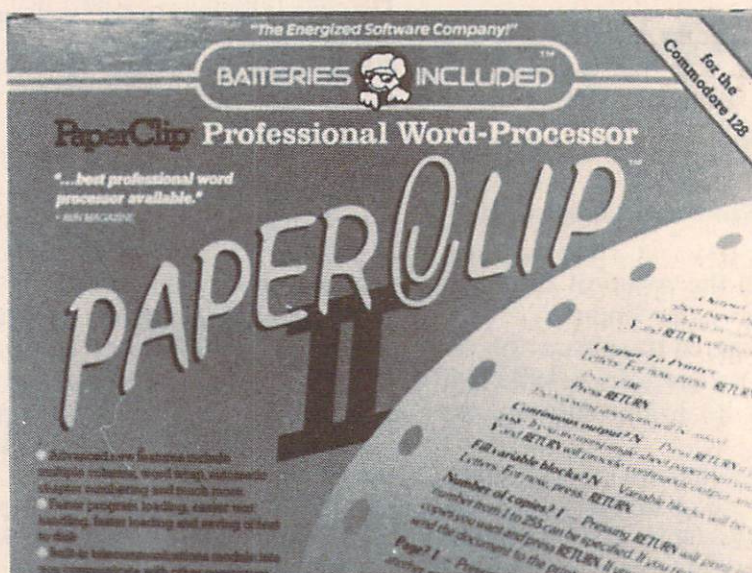
Progressive Peripheral's Bob Lentini has redefined the state of terminal software for both the 64 and the 128. His TermPro 64 last year established the standards for C-64 telecommunications. This year's sequel, BobsTerm Pro 128 is without peer. Not only does it offer more features and options than any other C-128 terminal program, but the manual is a detailed packed reference work.

Our choice, however, for the Application Product of the Year goes to Batteries Included's PaperClip II. While the product is just appearing as we go to press, we've been working with various beta versions for several months, and feel that there wasn't anything released this year that will match the productivity value of this remarkably powerful 128 package.

Still offering the familiar format of previous PaperClips and all of its features, Steven Douglas has added enough new features to make it much more than an upgrade. PaperClip II is a new and innovative product that expands the capabilities of what was already the most powerful and

versatile word processor available for a Commodore computer. PaperClip II may just be the best word processor for *any* computer.

Just two of the highlights of the new package are the addition of a powerful terminal package, accessible from within PaperClip II with the touch of a key; and a complete revision of the manual which now has grown to include both a quick users guide and a comprehensive reference manual. We'll be offering a detailed review in a future issue of The Guide; but for now we'll just offer our congratulations to Douglas and everyone else at B.I. who was involved in the development of our Application Product of the Year.



Best Game Of The Year

At *The Guide* we take games seriously. A great game not only provides hours of entertainment but also exploits everything the C-64/128 and the Amiga can do: code crunching, graphics, sound and music.

In 1986, the C-64/128 came into its own, dominating the computer entertainment software for both numbers of new programs and for the quality of those programs. The Amiga took its first steps toward revolutionizing entertainment software. After looking at (and playing) the new games of '86, we chose one each for the C-64/128 and the Amiga.

C-64/128 Game Of The Year Hacker II

Activision

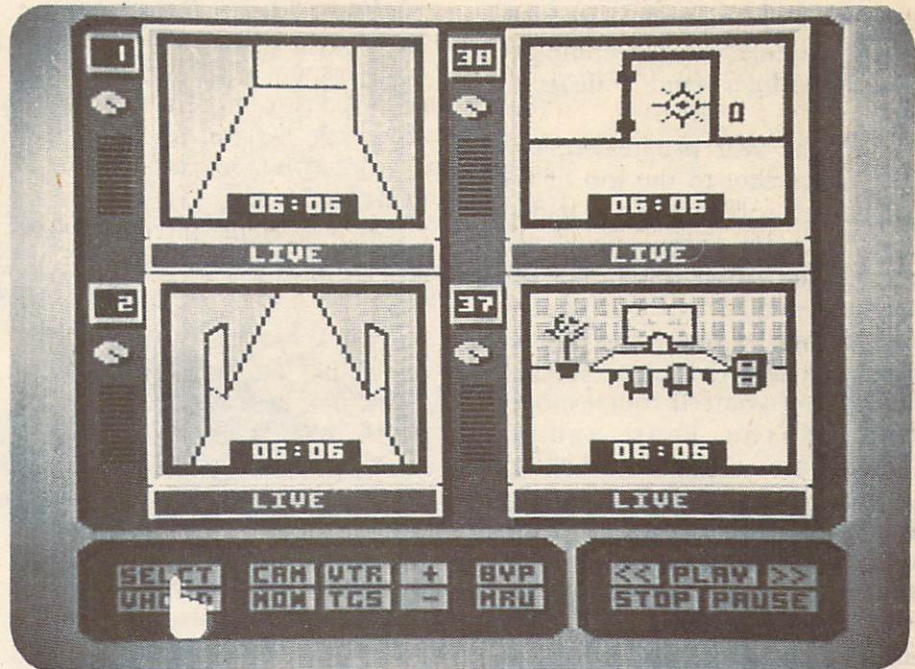
Programmer: Steve Cartwright
Producer: Brad Fregger

Some outstanding C-64/128 games were released in 1986, as evidenced by the other nominees in this Best Game category.

Psi 5 Trading Company (Accolade) used superb graphics and fast-paced strategy to update for the 1980's the classic combat and trading scenario of computer Star Trek games.

Leaderboard Golf Simulation (Access Software) featured a smoothly animated player, realistic golf action and graphically vivid courses in the best golf game ever for the C-64/128. And then the Carver brothers enhanced the original with sand traps and trees in the Executive Course Disk No. 1.

However, the innovative winner was a follow-up to one of the



most popular programs of 1985, Hacker II.

Hacker II was the rarest of the rare in the entertainment business: a sequel that surpassed the original. Though programmer Steve Cartwright had not planned Hacker II as a follow-up to the international espionage scenario of Hacker, this remote-controlled invasion of a Siberian security installation turned out to be an ideal (and superior) Hacker successor.

First, Hacker II began with a solid concept. The player is asked to manipulate remote robots, security cameras and video screens in order to penetrate a Soviet installation and steal pieces of a Top Secret plan. Like few other games, Hacker II could suspend the player's disbelief. While sitting in front of the C-64 staring at those video displays, you could almost imagine yourself masterminding the real thing.

Cartwright's execution was impeccable. His program

recreated four separately animated video screens, each with its own videotape recorder on the Commodore 64/128 monitor. And then there was an elaborate system of surveillance cameras remotely located throughout the Soviet stronghold and the guard that patrolled the building. So real was Cartwright's simulation that, by keeping track of the numbered surveillance cameras, you could accurately trace the guard's wanderings from one hallway to the next.

Producer Brad Fregger (also a Guide award winner in this issue) contributed a remarkable sense of detail to Hacker II from the noise bars during a fast scan with the videotape to the rolling pictures and onscreen static of the simulated video screens.

Hacker II is a classic. Part simulation and part fantasy, it appealed to the undercover adventurer in all of us.

Amiga Game Of The Year Marble Madness

Electronic Arts

Programmer: Larry Reed

Producer: Stewart J. Bond

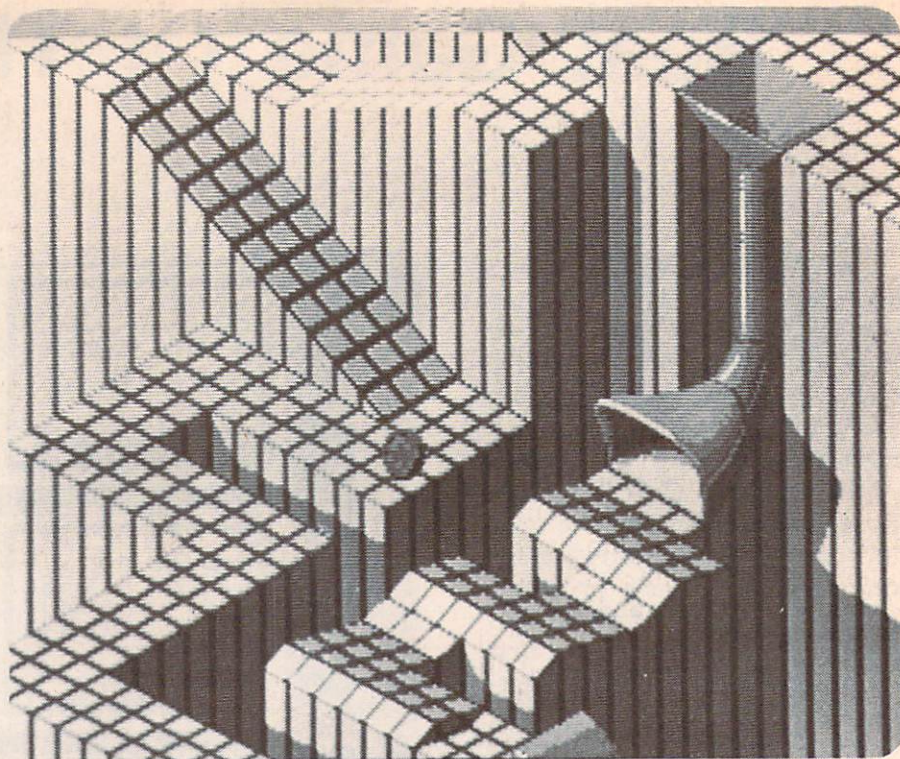
The Amiga's first year was a year of discovery as programmers and the public mutually experienced the wonders of the computer that Jay Miner (and colleagues) built.

As the year progressed, two golf games shot to the top of the Amiga best software lists: *Leaderboard Golf Simulation*, an outstanding simulation of life on the links; and *Mean 18*, an equally fine greens and sand traps amusement that had the added interest of a build-it-yourself course mode. And as the year ended, Cinemaware released its long-awaited *Defender of the Crown*, a graphically mind-boggling combination of conquest strategy and swashbuckling arcade action (which wins the *The Guide's* Best Graphics award in this issue).

And yet, the best Amiga game of the year was also the most highly anticipated Amiga game of the year. For thousands of Amiga owners, *Marble Madness* arrived and the world stood still; and so did their jobs, their families and their responsibilities.

Inspired by the marble maze games of our youth, *Marble Madness* electrifies those rolling puzzles by adding joystick or mouse marble control, otherworldly 3-D landscapes and a peculiar cast of marble-destroying characters. The variety of screens, the imaginative landscapes and the temptation of just another graphic wonder around the bend keeps players coming back for more.

What lifts *Marble Madness* to the level of the greats, though, was programmer Larry Reed's painstakingly faithful translation from arcade to Amiga. The colors of the Amiga allow an incredible recreation of the shadings and shadows of *Marble Madness'*



cross-hatched world. The special animation chips are exploited to bring slugs and vacuum cleaners and rotating marbles to life. Not only is *Marble Madness* fun to play, its detailed graphics also make it the ideal kibitzer's game.

But the final measure of *Marble Madness'* excellence is the two-player mode, an inspired design that has both participants simultaneously manipulating their onscreen marbles. It's their choice

whether to travel through the mazes cooperatively — alternately running interference against the baddies — or competitively — knocking one another into the abyss, edging your opponent into an acid pool or just generally getting in the way.

Marble Madness was the first program to define the Amiga's potential as a game machine. It is also the kind of program that converts computer haters into computer addicts.

Industry Party of the Year Mindscape

This was probably the easiest choice of all awards, it may have been one of the most diligently researched categories covered here. From our sometimes hazy perspective, however, there was only *one* party within the industry that warranted "must attend" status. For the second year running, Mindscape and its president, Roger Buoy, threw the party of the year in Chicago.

While Mindscape's bash firmly has established itself as *the* place for the hip to gather, we still aren't sure just what happened. Collective recollections seem to hint at lots of music, food, a variety of not-so-healthy beverages and a Who's Who assortment of the industry VIP's pushing the limits of public acceptability.

Perhaps next year we'll manage to remember just what it was that happened. What's that? Bob says something about Jr. Walker's music . . .

The "Are We Having Fun Yet?" Humor Award

Mind Mirror

Electronic Arts

In an industry that seems sometimes to be taken far too seriously by everyone involved, Dr. Timothy Leary burst onto the scene with his own witty, irreverent and hilarious version of a thought processor. Mind Mirror, while disguised as a stimulating thought processor, is in reality the computer incarnation of the best of Saturday Night Live, Lenny Bruce and National Lampoon.

Take just one trip up the fallopian tube of life analyzing as you go the attitude and thoughts of the particular little wiggler that you are and you'll be hooked. If you think it's humorous to look in the Mind Mirror by yourself, try it with a group of friends (or even strangers). A programmed blast of laughing gas from one of the masters of witty imagery.

The Late Night Award

(for the most television appearances by a computer)

Commodore Plus/4

Ever present at the late night hours on every imaginable number on the dial, save the local PBS station, that great doorstep impersonation of a computer, the Commodore Plus/4 could be seen more often than Johnny Carson, David Letterman and Joan Rivers combined. The Plus/4 has become the true king of late night television. Hawked by the voice that last week offered you the five-volume set of Slim Whitman's Greatest Hits, the Plus/4 prices ranged from \$88 to \$49. Tune into any nearby station for details!

The MVP (Most Valuable Philosopher) Award

Dr. Timothy Leary



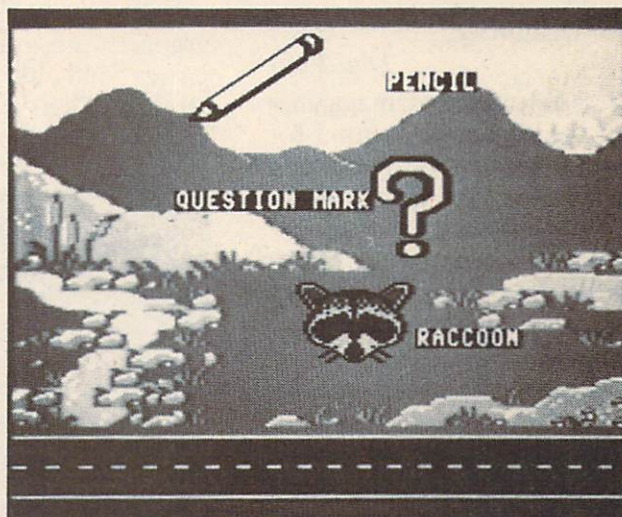
This one goes to the remarkable, revolutionary and revitalizing Dr. Tim. No one else has dared to publically explore the metaphysical and evolutionary implications of the home computer, much less do it with the insightful and stimulating style exhibited by Leary. His insight, wit and always daring opinions on the world of bits and bytes have proven to be some of the most entertaining and engaging contributions to the computer year.

Turning On, Tuning In, and Booting up with Timothy takes the personal computer from a game machine to a tool of evolutionary mind expansion.

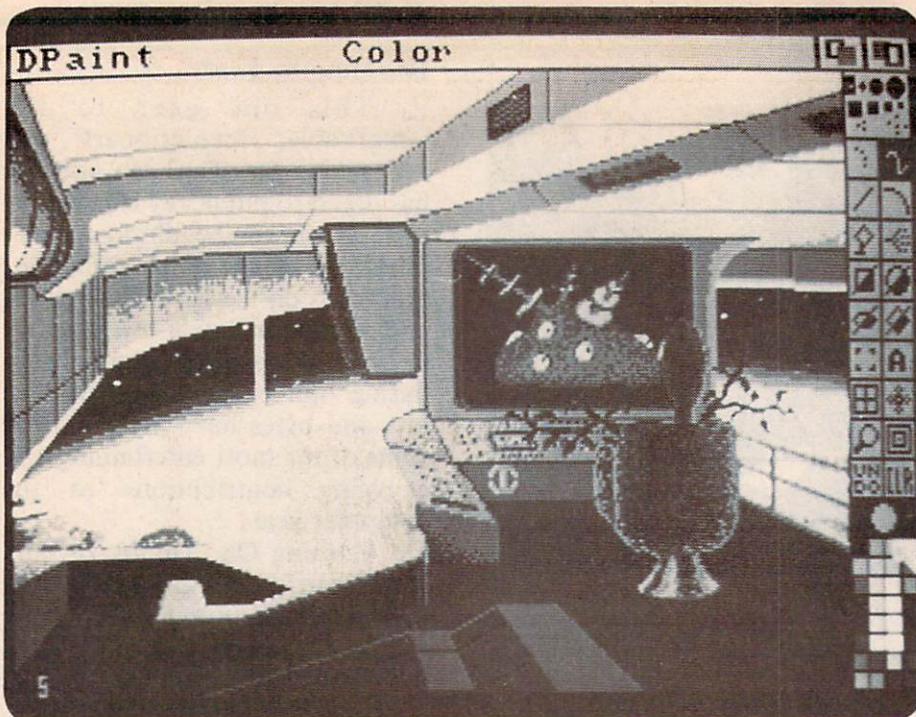
Pre-Schooler Hit of The Year

Talking Teacher

The best of the year in this category qualifies because it's just been resurrected and released by Firebird. Imagic's Talking Teacher was our choice for the



best toddler program on the market. Combining entertaining graphics, speech synthesis and a well-designed instructional plan, it not only had one child's wholehearted endorsement for over a year; but it also taught him his alphabet before he was two and a half.



Best Graphics Program for the Amiga

DeluxePaint

Electronic Arts

Aegis Animator

Aegis

The Amiga has the most powerful graphics engine ever put in a microcomputer. Little wonder that we had so much trouble deciding which of several outstanding graphics programs outdid the rest.

The two major publishers of Amiga graphics software — Electronic Arts and Aegis — had outstanding products for display graphics (EA's DeluxePaint and Aegis Images) and animated graphics (Aegis Animator and EA'S DeluxeVideo). In a year in which the competition wasn't so grueling as it was in 1986, *ALL* of them would be winners.

We couldn't decide; so, we award two Best Graphics Programs awards to DeluxePaint for its ease of use and for a potent upgrade, DPaint 2.0, that arrived just as this issue went to press; and, for animated graphics, to Aegis Animator, a program so easy to use that they can give any Amiga owner Disneyesque delusions of grandeur.

Amiga Hardware Product Of The Year

Digi-View Digitizer

Digi-View

Press releases and magazines extolled the Amiga's potential for digitizing and manipulating graphics; but it took Digi-View to deliver the real thing.

Using an inexpensive black-and-white video camera, or any still frame video source, Digi-View can produce a full color, digitized image in about 30 seconds. An impressive achievement in itself but when coupled with the flexible software provided with Digi-View, this product became one of the Amiga's most powerful tools.

With the capability to digitize pictures in all the Amiga graphics modes, Digi-View allowed users to generate IFF format graphics files (that could be modified by Deluxe Paint or Aegis Images); or, users could digitize stunning pictures in 4096 colors using the Amiga's

Hold-and-Modify (HAM) graphics mode.

Its compatibility with other graphics programs, its flexible power and its affordable price establish Digi-View as a model of what an Amiga peripheral product can be.



Sports Simulation of the Year Basketball: The Pro Game

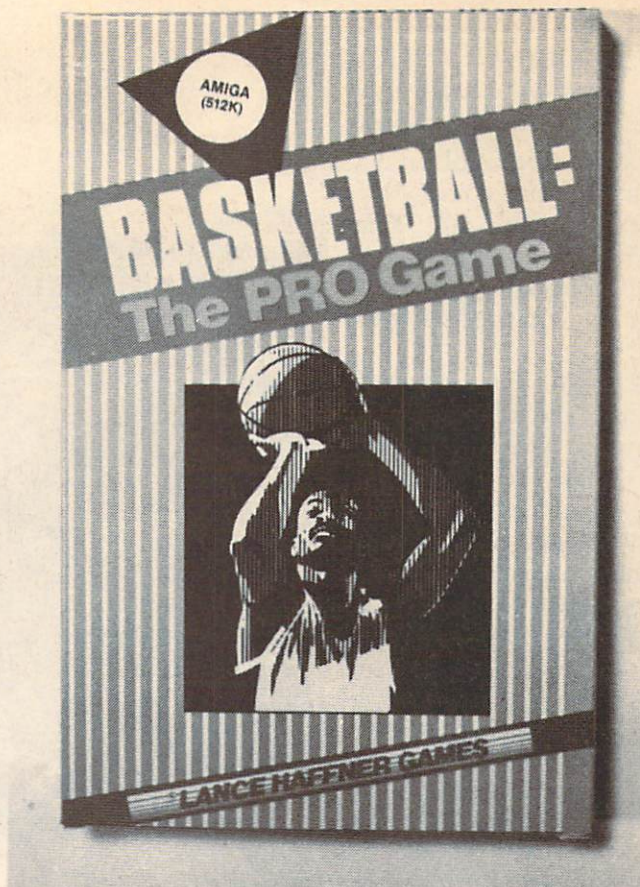
Lance Haffner Games

Simulations, by nature, are a different breed. While some offer graphics, their value is based on the statistical realism they offer, on their playability and on their ability to recreate the feel and atmosphere of the sport.

Pure Stat Baseball, designed by Quest and marketed by subLogic, was an impressive entry into the field. Combining good graphics with carefully researched statistics made it a serious contender. In the end, we felt that its limitation in the number of historical teams was a detriment to the avid simulations fan.

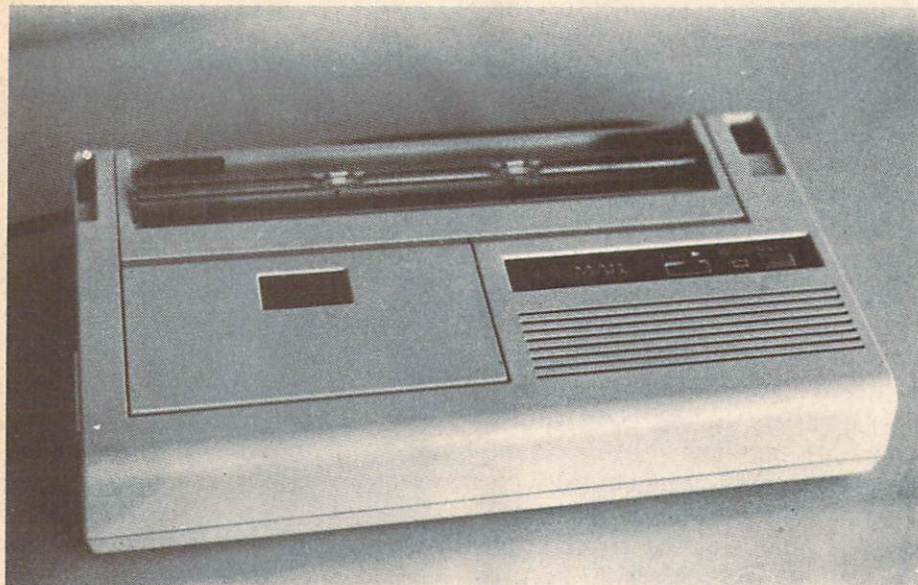
Focusing entirely on the statistical recreation of teams, present and past, Lance Haffner Games has captured both football and basketball in playable and entertaining simulations. Yearly data disks are not only affordable, but provide almost every college team in the country. The product is supported by a library of disks that allow the gamer to reach far back in time.

While the appeal of football is greater than that of basketball, our choice for Sports Simulation



of the Year is Haffner's Basketball: The Pro Game. Perhaps better than any other simulation we've played, it best captures that feel of sitting on the bench shuffl-

ing players in and out, adjusting to the ebb and flow of an NBA game. As with Haffner's football program, a wide range of historical teams are available.



Best Printer Value

Okimate 20

Peripherals for Commodore computers traditionally are more expensive than the computer itself. The rule of thumb is that if it's good, it's gotta cost more. Okidata has turned the tide with the remarkably affordable Okimate 20 color printer. You bring one home without hocking your disk drive and monitor and it is supported by both the 64 and Amiga. Now colorful Doodles and Deluxe Paint masterpieces can be printed out in full color and hung proudly on the door of your refrigerator.

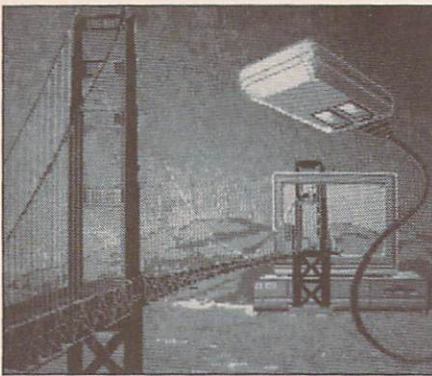
C-64 Hardware Product of the Year

FSD-1 5¼" Disk Drive

*Emerald Component
International*

At last someone has offered a disk drive that is price compatible with the Commodore 64! The FSD-1 is priced at only \$139 and performs at compatibility levels that surpass any of the previous 1541 clones.

In tests by The Guide's technical editor, the ROM's of the FSD-1 showed little difference from the ROM's in the 1541. Little wonder that this priced-right drive is so compatible and able to deal with even the most esoteric copy-protection scheme, a boast that can be made by few third-party disk drives.



Artist of the Year

For the Amiga: Jim Sachs

For the 64: Wayne Schmidt

In light of Sach's trend-setting work in *Defender of the Crown*, there wasn't any competition for this award. Jim Sachs has created some of the most stunning artwork ever created on any computer. Featured here is his Golden Gate Bridge, which we published on our June 1986 cover.

Over the last three years, Wayne Schmidt has exhibited the ability to squeeze from the 64 some of the most entertaining and expressive graphics ever seen, using a variety of different tools. Users are familiar with him from his artwork samples included with *Doodle* and *Flexidraw*. Featured here is his Pagoda from our September 1986 issue.

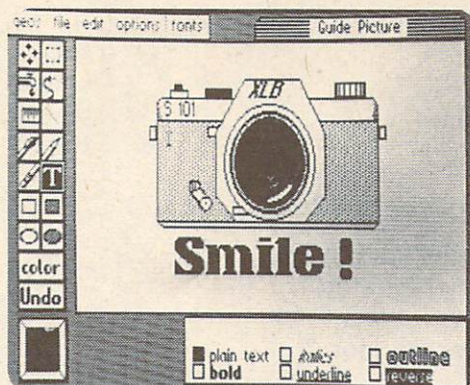
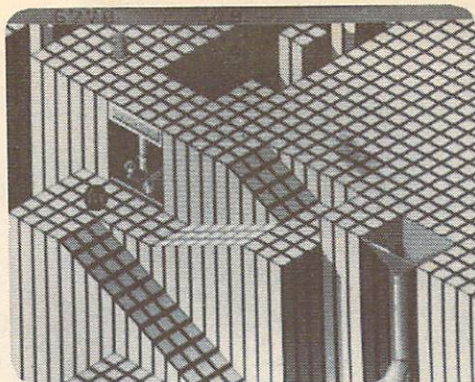


Best Arcade Adaptation Marble Madness

Electronic Arts

Just like the arcade version — a dream came true for Amiga owners when programmer Larry Reed's version of the popular Atari Game Corp. stand-up game *Marble Madness* hit the small screen. It was just like the arcade version. The acid pools, the pneumatic bridge-lifter, the ball-eating slugs, the vacuum cleaners — all just like the arcade version.

And then came the C-64 version . . . not quite as good or as playable as the Amiga version, it couldn't be; and yet, Will Harvey took the C-64 to The Outer Limits in cramming so much of *Marble Madness*' action and graphics into an eight-bit computer. Actually, he crammed a little more of *Marble Madness*' action into the C-64 because that conversion contains an extra, secret level not contained in the Amiga version. What a deal!



Best Graphics Program for the C-64 GEOS

Berkeley Softworks

Though highly touted as the end-all and be-all operating system for the C-64, we see GEOS (the Graphic Environment Operating System) as the best graphics program. Its use of icons and menu to simplify the complicated and sometimes confusing Commodore disk operating system made the C-64 accessible to a new range of users and pointed toward a future of desktop publishing applications.

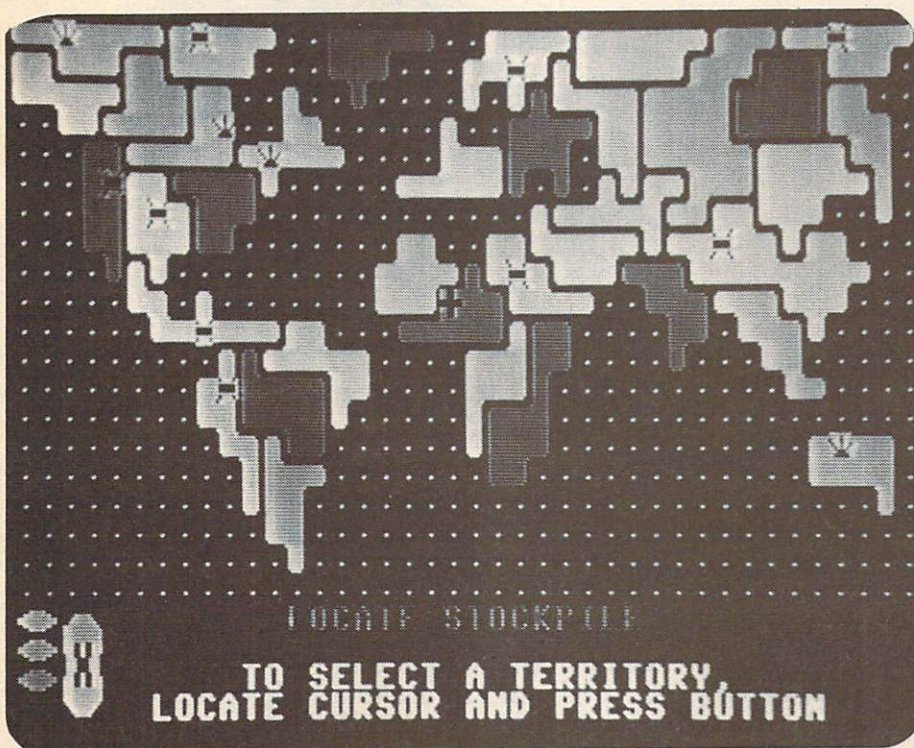
Yes, it may have imitated the desktop metaphors of other computers, notably the Apple Macintosh; but its effectiveness in using images to clarify the confusion of DOS commands wins for it our nod in the graphics department.

Gather 'Round The Conquering Hoards Award for the Best Multiple-player Game

Lords of Conquest

Electronic Arts

Computer games traditionally are solitaire affairs. Some offer the option of two or more players taking turns against the computer. Occasionally, though, some enterprising company releases a multiple-player game that gets people together instead of isolating them together against King Computer. *Lords of Conquest* took the basic premise from the Parker Brothers board game, *Risk*™, enhanced and modified it into an entirely new game. With options for one to four players, this game is guaranteed to provoke arguments, generate grudges, test loyalties, and consume endless late night hours, just like the board game that inspired it.





The Phyllis Diller Facelift Award 64C

Commodore

The tubby Commodore 64 was showing her age. Yes, she was a hot number once. In recent years, though, she was starting to look a little big around the keyboard. It wasn't that she put on weight. It's just that the world had moved on to slimmer, trimmer, sexier CPU's.

So off went the C-64 to a drawing board and returned as the slimmer, trimmer, sexier (and more expensive) Commodore 64C. With a new body and a few new tricks (in the form of GEOS), there may be some life in the old gal yet.

The Industry Best-Dressed Award

This recognition of sartorial splendor goes to The Guide's own Bob Sodaro for his many stylishly attired appearances at trade shows.

The guy wears red shoes. Need we say more?



The Longest Program Loading Time

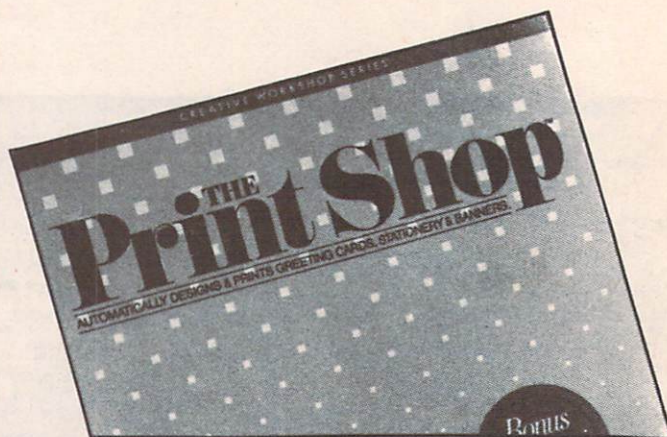
Anything by

Electronic Arts

Turn on the disk drive. Open up some liquid refreshment. Put up your feet and take a nap. By the time the program comes up on the screen, you'll be refreshed and tipsy. Electronic Arts has a flair for solid copy protection schemes. We don't blame them. It's a jungle out there. But do they have to be so slow to load?

We wanted to identify the specific EA program that took the longest; but we can't be conclusive. We're still waiting for them to load.

Tune in next year.

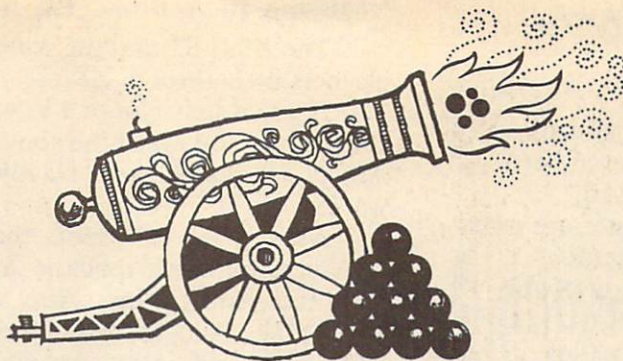


The Most-Cloned Program Of The Year The Print Shop

Broderbund

Imitation is the sincerest form of flattery. No program has ever been flattered more than Broderbund's The Print Shop.

Print a newspaper, print a greeting card, print a banner, print a certificate, print a subpoena — they all come from different software publishers and they all fall not-too-far from the inspiration and the letter of the original.



R.I.P. 1986

CardCo

Even in this ever-changing industry, some companies become solid bastions of stability. They've always been there and always will be.

For as long as people wanted to connect printers to C-64's, Cardco was there with a workable and affordable solution. This one-time bastion, however, was the largest casualty of a summer of industry shakeouts. The victim of a domino effect created by the failure of a very large distributor and the doom and gloom perspective of bankers convinced that the home computer "fad" had ended, Cardco joined the ranks of the late-great of the Commodore world.

But, as in movie westerns where the good guys *never* lose, life does sometimes imitate art. The good guys at Cardco partially have resurfaced as C Ltd. and aggressively are continuing with hardware support for the Amiga.

Where Are They Now?

Ponder the unknown fate of these silicon goodies — revealed, promised and, at this writing, still undelivered:

Genlock
Sidecar
Return to Atlantis
Amiga Live!
Amiga Turbo Pascal
The Commodore Lap Held Computer
The 1581 3.5-inch Disk Drive
The PC 10 and 20 IBM compatibles
The 1571D double disk drive
The IBM cartridge for the C-128
StarDOS
Commodore/Amiga

Most Innovative Copy Program

Kracker Jax

Side-stepping the politics of the issue, we were impressed with the novel approach of Kracker Jax. While every company seems to have a nibbler, copier, or disk duplicator for sale, it was refreshing to see someone address an entirely new aspect of the copy protection battle. Instead of making a duplicate of the original, Kracker Jax strips the protection routines from programs.

Users of third party disk drives have been frustrated by ultra-complex protection routines that can be loaded *only* with a 1541. Kracker Jax solves that problem once and for all.

ACTIVISION
ENTERTAINMENT SOFTWARE®

The Engulf And Devour Award Activision

And who could that be? Last year, they were only Activision.

This year they are also GameStar, Infocom, Personal Choice (formerly Creative Software) and Electric Dreams.

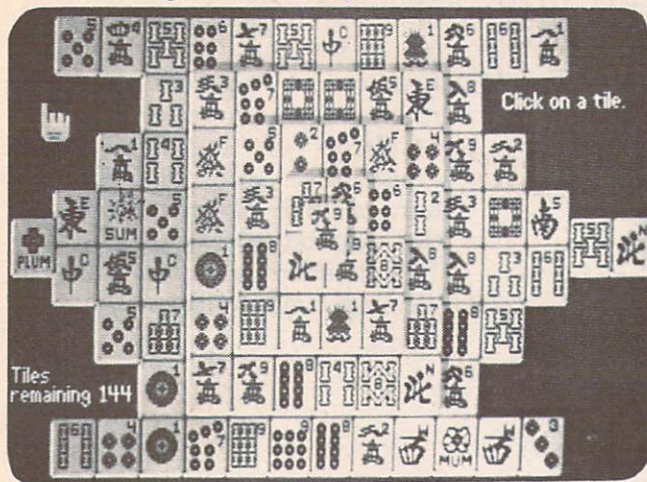
Look out, Beatrice Foods.

The Bet You Can't Play Just One Award Shanghai

Activision

Well, waddaya know, it's morning already. And chances are the bedsheets haven't even been opened. Shanghai (Activision) has arrived.

Board games brought to the computer are often like touching up the Sistine Chapel with an airbrush; but Activision's computerization of the classic Mah-Jongg board game for the C-64/128 and the Amiga fit as tightly as two ivory tiles.



Whether played in solitaire against the computer or against a human opponent in a timed moves mode, Shanghai was the most irresistible, the most infectious and most addictive game of 1986.

The C-64 version, realized in two-color high-resolution graphics mode, had a clever way of imitating the stacks of ivory Mah-Jongg tiles. The Amiga, however, was in a class by itself, a breathtakingly realistic graphics display that achieved the letter, the spirit and the look of the real thing.

But whether played on the Amiga or the C-64/128, any intention to play "just one" game of Shanghai inevitably resulted in an hour or more at the computer screen.

Worst Idea Award

What's the first thing that many people want to do with an Amiga? Incredibly enough, it's to run old Commodore 64 software. Unbelievable.

So, some enterprising folks are out there programming a C-64 emulator for the Amiga. No matter

"Missing In Action" TV Award

The Atari ST and the Amiga? Are those vacuum cleaners or bathroom cleanser?

If you watch a lot of TV, we mean *A LOT* of TV, chances are you asked the above question. Neither the Amiga nor the ST were exactly burning up the video waves.

After a few TV spots that seemed destined to convince the world that the Amiga was an old man with futuristic clothes, Amy disappeared from the boob tube. And the ST? Well, if it could make a desirable sound on its own *maybe* it could do radio.



The Thrift Shop Award Golden Oldies

Software Country

Take a few old PD programs. Patch in several pieces of prose scavenged from several previously published sources, take a cue from the pop music business and you have Software Golden Oldies.

It was a great idea. The only bad idea was that this recycled grab bag cost \$30.

that the disk sizes are different. No matter that the disk formats are different. No matter that the emulator will probably cost as much as a brand new C-64.

Why hang on to that friendly old C-64 when you can waste money and tie up a state-of-the-art Amiga by crippling it into C-64 behavior?

The "Keep The Customer Satisfied" Award for Responsive Programming Quest, Inc.

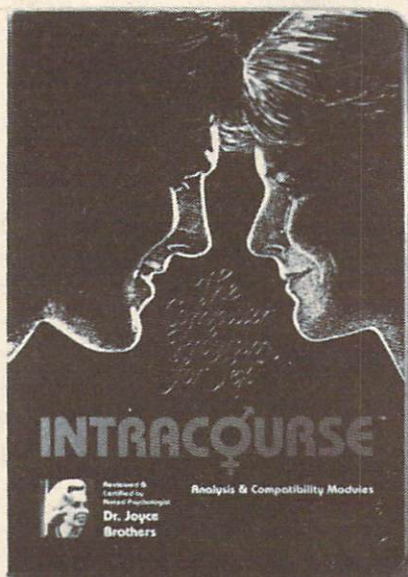
Customer service is something that all software companies claim to provide. The unfortunate reality is that customer support is much like politicians promising lower taxes: a lot of wind and little motion.

Quest, Inc., an independent development company composed of Ben Riordan and Ed Daniels, has carved out a respectable reputation for sports games which have been marketed by several companies. They've won the respects of their users for Football (subLogic), The World's Greatest Baseball Game (Epyx), SuperBowl Sunday (Avalon Hill), and most recently, Pure Stat Baseball (subLogic).

They've won the hearts of their users for their unprecedented attempts to make Pure Stat Baseball the ultimate baseball game. When the game was ready for production, review copies went out to the press. After fielding a number of complaints from writers who disagreed with Quest's ratings of some players, Daniels made modifications to allow the gamer to override the ratings.

Shortly after the game's release, users started calling with suggestions for improving the graphics. Daniels again burned the midnight oil, fretting over such details as the flight path of the batted baseball. If we didn't lose count, we think there were three upgrades in the first month Pure Stat Baseball was released.

When asked about subLogic's reaction to his ongoing attempts to fine tune the product, Daniels commented that he wasn't winning any popularity contests with the folks at subLogic; but we can assure him that he's won a special place in the hearts of gamers who take their baseball seriously.



The Marilyn Monroe/UltraBright Award for Software Sex Appeal IntraCourse

IntraCourse

Not having many sexy programs from which to choose, we opted for the amount of raw sex in the program. On that basis, IntraCourse (or InterAction, if you prefer the newer, tamer name) wins hands down. This analytical package attempts to evaluate, analyze and compare the sexual preferences and practices of its users.

While it's obviously not intended to be a Gather the Family Around the Computer program, this is one of the most interesting, novel programs offered for the Commodore 64 during 1986.

An Amiga version is forthcoming which promises to offer the expanded (and more explicit) questions available to IBM users but excluded from the C-64 version.

Best Graphics Award

For the C-64/128:

Leaderboard Golf

Executive Course Disk No. 1

Access

For the Amiga:

Defender of the Crown

Master Designer Software

Access Software had a winner with their Leaderboard Golf Simulation but it was a rather peculiar golf course that, nonetheless, looked so good on the C-64/128 screen. The fairways were completely surrounded by water, you couldn't go into the rough and there was nary a tree in sight.

The Amiga version came out and solved all those problems. But it also frustrated C-64/128 owners who had now seen a better Leaderboard world.

And then Access released the add-on Executive Course Disk — two new 18-hole courses, sand traps, trees, roughs, everything that the first version lacked. And graphics that were remarkably similar to the Amiga's. Bravo.

In the meantime, game designer Kellyn Beeck and graphic designer Jim Sachs were forcing the world to reevaluate microcomputer graphics with Defender of the Crown. Simply stated, Defender is the most detailed, most graphically brilliant, most beautiful software program ever released for any microcomputer.

Raid the castle and flickering lights cast your sword-fighting shadow across a castle wall. Mount your steed and ride off in a galloping point-of-view depiction of a joust. Clash steel in a courtyard and try not to be distracted by the glow of the night sky and an occasional shooting star.

From the glimmering bronze of the title page to the fluttering eyelids of the heroine, Defender of the Crown is a visual feast, a triumph for Beeck, Sachs, Master Designer and the Amiga computer.



Best Freebie

Polyscope

Electronic Arts

Everyone who has an Amiga has it. And for the pioneer 1985 purchasers of the Amiga, it was *all* they had for a long, long time.

With the Amiga's wild palette of colors and undulating animation, Polyscope is a real eye-catcher and mind-grabber.

And contrary to what another magazine says about Mind Walker, we think that Polyscope best emulates a psychedelic experience.



Marching To Your Own Drummer Award

Infocom

With everyone else hopping on the graphics bandwagon, Infocom has remained true to the classic text adventure, believing that the best graphics exist between your ears.

And within its world of words and punctuation, Infocom reigns. The team in Cambridge has stretched branching and parsers and computer prose far beyond the Colossal Cave.

YOU SEE A MAILBOX WITH A NOTE IN IT.
Take note and read it.

THE NOTE SAYS "CONGRATULATIONS INFOCOM."



Most Effective Use Of Sound

For the C-64/128:
Kennedy Approach

Microprose

For the Amiga:
Mean 18

Accolade

We're not necessarily talking the best sound here, just the most effective.

That air traffic controller's voice in Microprose's Kennedy Approach not only persuades you that you're about to crash the real item, you simply cannot get through the simulation without it.

There may be more impressive uses of Amiga sound than in Accolade's Mean 18. Still, when you barely miss a putt and the crowd coos its supportive sighs of disappointment, you don't feel like such a klutz, after all.

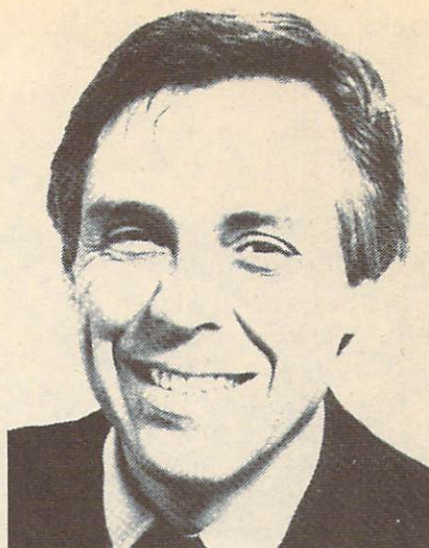


The Most Mindless Use Of Sound
Racter

Mindscape

Just what the world wanted: a computer that talks in nonsense verses. All those words, all that voice and nothing important to say with them.

Why bother? When we want to hear something that sounds bizarre and illogical, we can sit around the office and read old Commodore press releases out loud.



Producer Of The Year

Brad Fregger

Activision

He's one of the unsung heroes of entertainment software. The orchids and kudos may go to the programmers but it's often Fregger's discerning eye that catches the blunders and concocts the boffos.

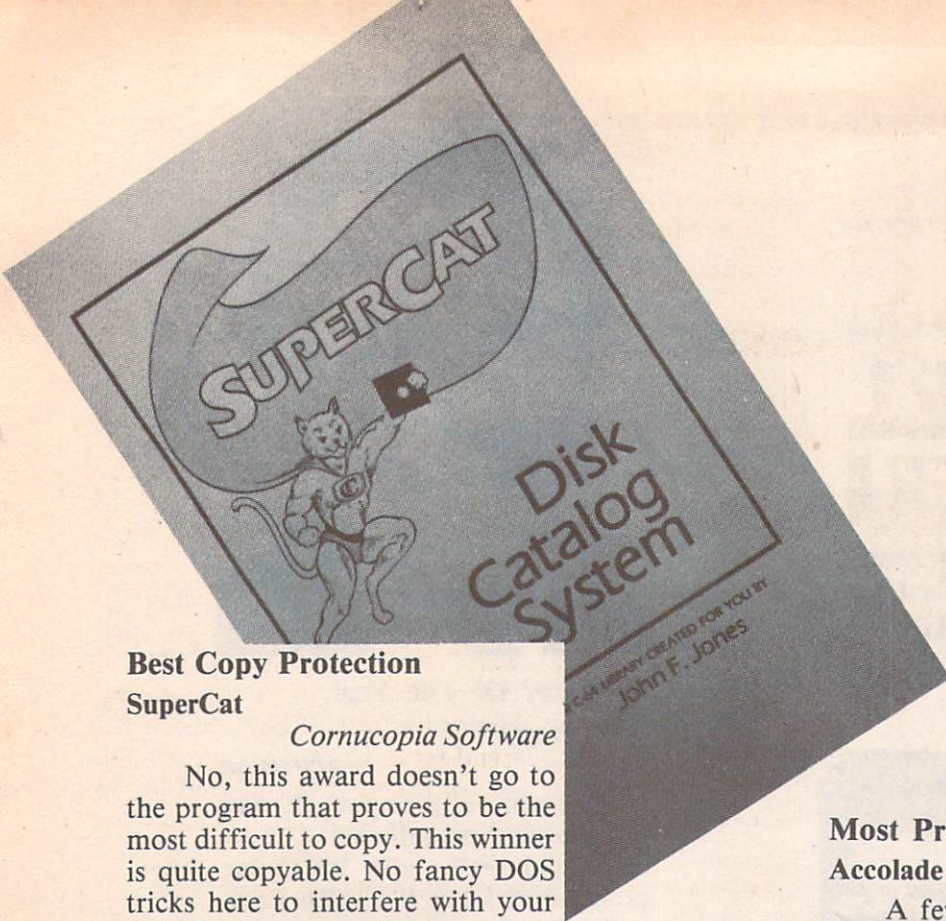
In the past year, a few of the projects that Fregger supervised have included some of the most innovative, imaginative and creative games of the year including Murder on the Mississippi and The Guide Award-winning Hacker II. His guidance and artistic input are keeping Activision at the forefront of innovative software design.

Best Graphics In A Word Processing
Program
TextCraft

Commodore

Worst Word Processor In a Graphics
Program
TextCraft

Commodore



Best Copy Protection SuperCat

Cornucopia Software

No, this award doesn't go to the program that proves to be the most difficult to copy. This winner is quite copyable. No fancy DOS tricks here to interfere with your disk drive or your nibbler.

The catch, however, is that at some point down the road, the illegal copy you made is going to make significant changes to your data disk. Then the program explains that your now-useless data can be salvaged if you mail your corrupted disk to Cornucopia, along with a check for a legitimate copy of the program.

The Copy Wars Award for Best Copy Program

Fast Hack 'Em

Basement Boys Software

Copy programs and the companies that produce them go in and out of fashion just as quickly as the next set of new software releases. Mike J. Henry, however, has carved out a comfortable niche with his continually updated and upgraded Fast Hack 'Em.

If you need a copy program, and you don't want to start a collection of them, the best overall value for your money remains Fast hack 'Em.

The Unanswered Questions of The Year

For Jack Tramiel: Hey Jack, if the 520 ST is really that much better, why did you waste all those dollars in court trying to get the Amiga?

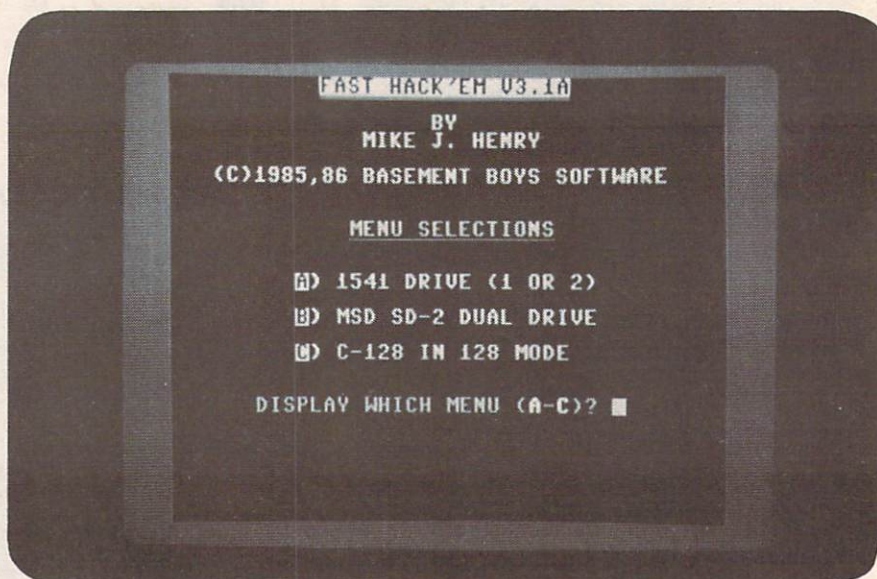
For Commodore: Will we ever see a marketing campaign (*i.e.*, advertising) for the Amiga? Or is the plan to see how many it can sell with no advertising support (a la the SX-64) before discontinuing it and moving on to the next *underground* computer?

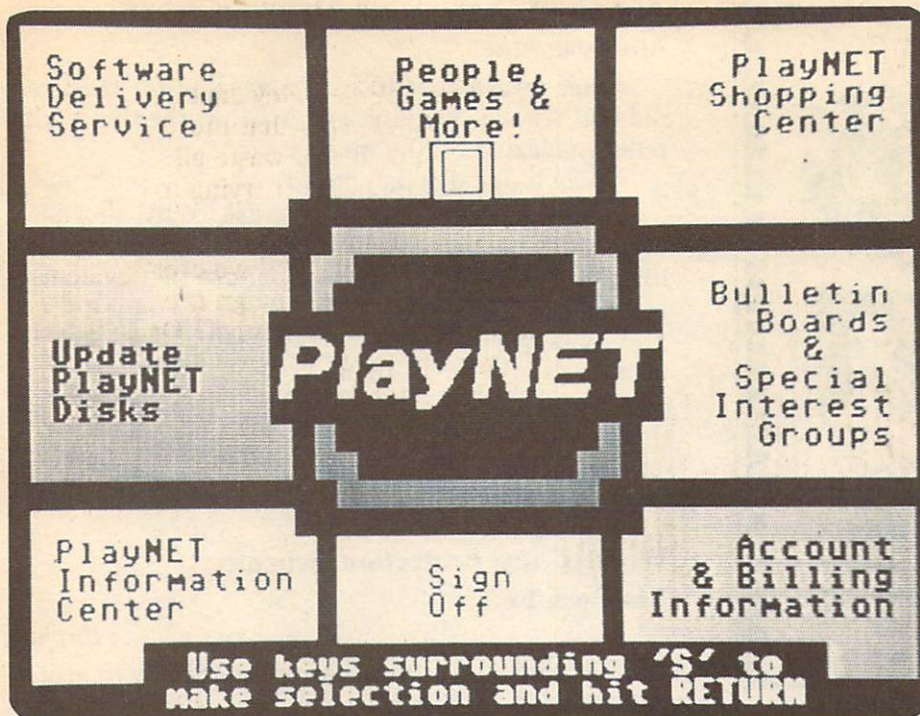
Most Promising Newcomer Accolade

A few battle-scarred veterans of the videogame cartridge wars banded together and created a computer software company: Accolade.

With early releases like *Law of the West*, *Psi 5* Trading Co. and *The Dam Busters*, this fledgling company composed of old pros set new standards in Commodore 64 graphics, not to mention the outstanding playability of games like *Psi 5* and *Hardball!*

The hits and the graphics just kept coming, from *Mean 18* to *Ace of Aces*. In one year, Accolade had gone from New Kid to Class Act.





The Against All Odds Award for Survival In Spite Of ... PlayNET

When PlayNET licensed their software to Commodore for use in QuantumLink, most industry experts (ourselves included) surmised that the handwriting was on the wall. How could PlayNET hope to survive with QuantumLink offering the same service but with the advantage of being supported, promoted and financed by Commodore? It wasn't a promising scenario for PlayNET survival, especially when they filed for Chapter 11.

While QuantumLink has become the happening place for Commodore owners, PlayNET is still hanging in there. Reports are that they are actually nearing a state of profitability and will be emerging from their legal limbo in the near future. The bottom line, however, is that while Commodore/QuantumLink have attained the ever-growing user base that PlayNET once dreamed of, PlayNET seems to be finding a niche as the alternative network.

The Computer Widow's Pick Of The Year

The Computer Widow's favorite product is the Mouse House, that fabulous little fake furry cover complete with eyes and ears, designed to keep sweaty palms from sticking to the hard, cold plastic of the Amiga mouse. No Amiga owner with couth would be caught without one. No cat with couth would be caught with one.

The Home Grown Software Award for the Best Small Company

Lance Haffner Games

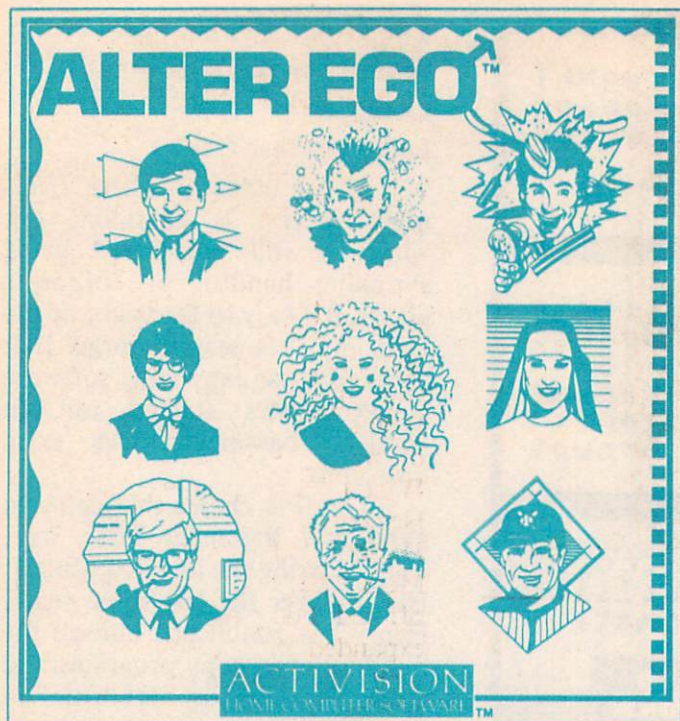
In an industry where overnight success is common, but which is still dominated by a shrinking handful of corporate giants, it's easy to lose sight of the little guy. It's easy to forget that many of these expanding software conglomerates started out in garages, basements and extra bedrooms.

The first choice that came to mind was Basement Boys Software, starring the talented Mike J. Henry. Over the last three years, Henry has established himself the trend-setter in copy programs and one of the foremost authorities on the 1541 disk drive.

63 GREEN BAY	0	0	7	0	-	7
82 COWBOYS	10	7	3	0	-	20
QTR 3	TIME	5	:	23		
63 GREEN BAY	YL: OWN	16.2				
DOWN 1	TGGO:	10				
SCOUTING REPORT	63 GREEN	B82	COWBOYS			
RUSH AVG	5		4.1			
FUH %	4		6			
COMP %	52		56			
INT %	7		5			
AUG/COMP	16		12			
PUNT AVG	44		42			
FG %	45		70			
EP %	93		99			
SACK %	7		10			
HIT ANY KEY TO CONTINUE						

But honors this year go to Lance Haffner Games in Nashville, Tennessee. Like Basement Boys, Haffner is basically a one-man show. While he hasn't achieved the notoriety (and perhaps the prosperity) of Henry, Haffner has released a line of products that do what they do better than anything else. Leaving the fancy graphics to the big boys, Haffner has concentrated on developing simple but comprehensive sports simulations.

To date he has released both college and professional basketball games and a football simulation that encompasses the NFL, NCAA and even provides for the now defunct USFL.



The Moral Majority Award

Alter Ego

Activision

Real life role-playing was the point of Dr. Peter Favaro's novel amusement based on hundreds of authentic interviews with authentic people.

But when we assumed the role of a hoodlum (just pretending, you understand), we always got punished for our misdeeds, suffered for our nastiness, failed in our seduction attempts. In the meantime, the good guy usually got ahead.

Be nasty and you will have to pay. That's the simplistic message of *Alter Ego*, *Miami Vice* and *Jerry Falwell*. In our world, evil sometimes triumphs. Guess we're living in the wrong world.

Most Time-Consuming Computer Task

Flight Simulator

SubLogic

At first, we thought the longest thing you could do with a microcomputer was compile C code with the Amiga Metacomco compiler.

But then we discovered the New York to Los Angeles flight in *SubLogic's Flight Simulator*. Taking place in real time, that's a six-seven hour trip. Six or seven hours of staring at computerized dials, needles and gauges. Does that sound like a good time, or what?

Coffee, tea or No-Doz?

The Benn Dunnington Humility Award

Info Magazine

This award goes to Info magazine for their candid and critical evaluation of which is the finest computer magazine on the market.

Which one did they pick?

We're surprised you had to ask. Why, they picked Info, of course, and Info Editor Benn Dunnington told the world in his semi-annual product evaluation issue.

Benn would probably say that it's a joke. We agree. It's a joke, all right.

Worst Copy Protection Scheme

LensLock Elite

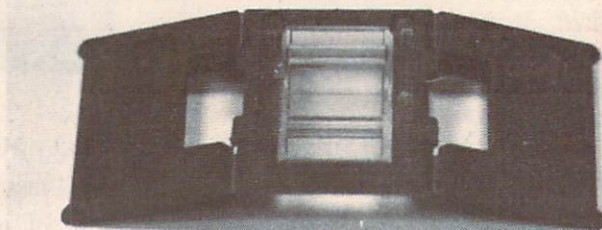
Firebird

Lenslock — the most inconvenient way to protect commercial software and a sure cause of nearsightedness.

This miracle of the 1980's was a cheap plastic lens in a cheap plastic holder. As the program booted up, a peculiar-looking design appeared on the screen.

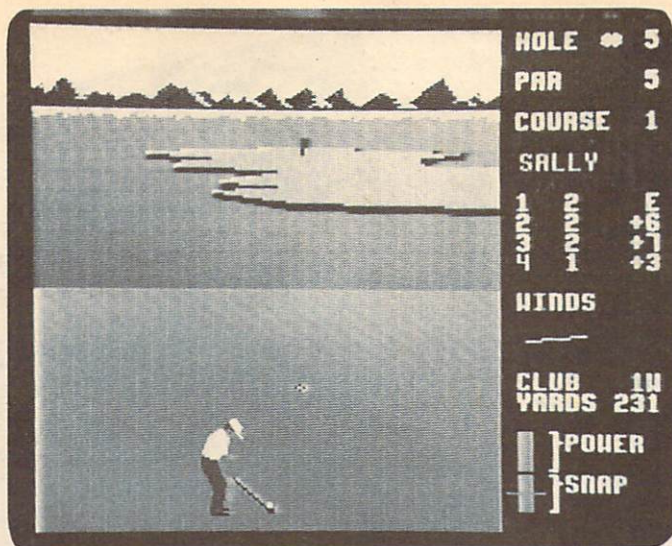
Users were prompted to adjust the design to equal the width of the LensLock gadget. Then you folded up LensLock, held it tightly against the computer screen, hit a key and tried to read the real message that was distorted through the LensLock lens. Now try to compute in that position.

Muscle cramps, eyestrain, confusion and a severe case of rage preceded every game of *Elite* because the LensLock device was so cheaply made that most of



the time you couldn't tell what the second screen said even if the whole shebang was adjusted correctly.

But don't take our word that LensLock was the worst copy protection. Even *Firebird* thought so. After shipping a few of the LensLock-protected versions of *Elite*, the company abandoned the device. Yes, Virginia, sometimes there is justice in the world.



Least Ambitious Software Product

A Disk

MegaSoft

What an exciting ad! A two-drive emulator that lets you run and load programs without continually swapping your Workbench disk in and out on your one-drive Amiga system! \$29.95.

Try this Amiga owners:

First, summon ED the text editor by typing: ED Ramdisk

Then, while you're in ED, type:

```
Makedir Ram:C
Copy C: to RAM:C
Assign C: RAM:C
```

Hit the CONTROL key, type X and hit RETURN.

Then, anytime you want to "Run and load programs without continually swapping your Workbench disk in and out," type: Execute Ramdisk.

On the Amiga Operating System, creating a ramdisk is built into the system. Hey, you just kept \$29.95 of your hard-earned greenbacks away from MegaSoft. Of course, if you feel so inclined, we would also accept your voluntary \$29.95 contribution.

Sports Arcade Game of the Year

Leader Board Golf

Access Software

The competition was wild and furious. Few categories offered as many quality products worthy of mention. The release of Gamestar's Championship Basketball offered a stunning combination of quality graphics, two player action and addictive league play. Epyx extended the life of the classic Summer Games with Winter Games and World Games. Newcomer Accolade served up Hardball for baseball buffs and Mean 18 for golf buffs. SubLogic offered Football. GameStar also expanded their sports arcade line with the innovative Star Rank Boxing.

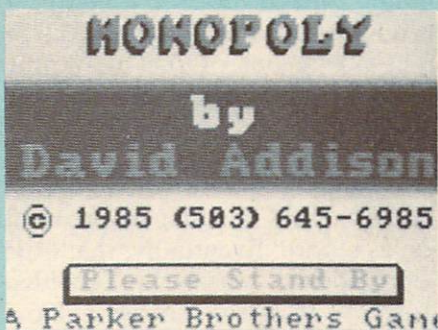
Our choice, though, for Sports Arcade Game of the Year for the C-64 is Leader Board Golf from Access. It provides a realistic and playable game as well as stunning 64 graphics. Any questions about its qualifications quickly were erased with the release of the Executive Tournament Disk No. 1 featuring enhanced courses that approached the quality of Amiga graphics.

Best Public Domain Programmer

David Addison

The release of ABasiC with the early shipments of the Amiga was met with hallelujahs and howls from BASIC programmers. Some loved it, others said it was a flawed rush job.

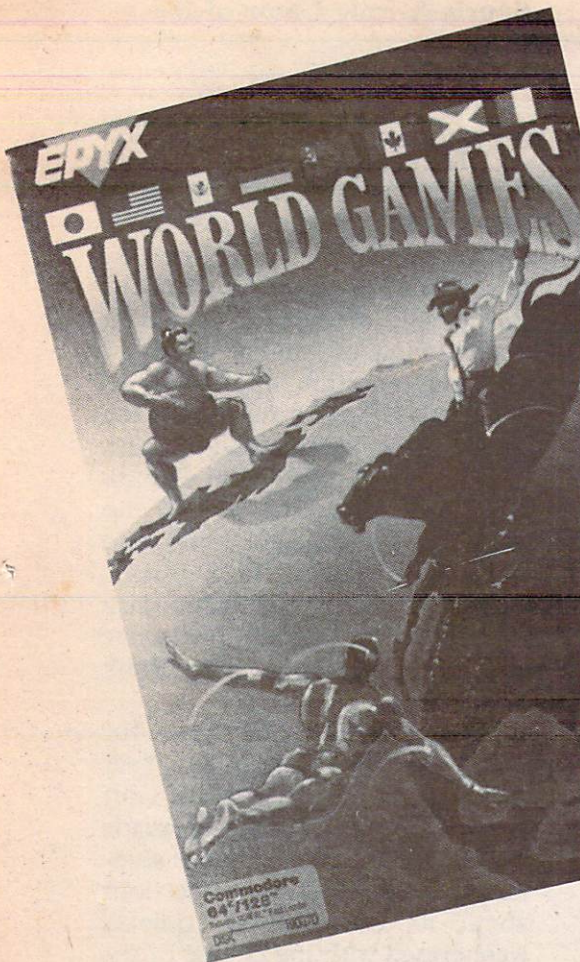
But, no matter what one's opinion of ABasiC, David Addison's faithful and graphically authentic version of Monopoly,



one of the best games ever released to the public domain, made everyone reconsider their stand.

Addison followed Monopoly with Solitaire, TunnelVision, Milestone, and Othello — all first-rate from their clean design to their crisp graphics.

Addison's programs helped make the world sit up and take notice of the Amiga and, together, represent one of the most impressive bodies of PD software ever created by an individual.



The Rocky/Rambo Award For Best Series

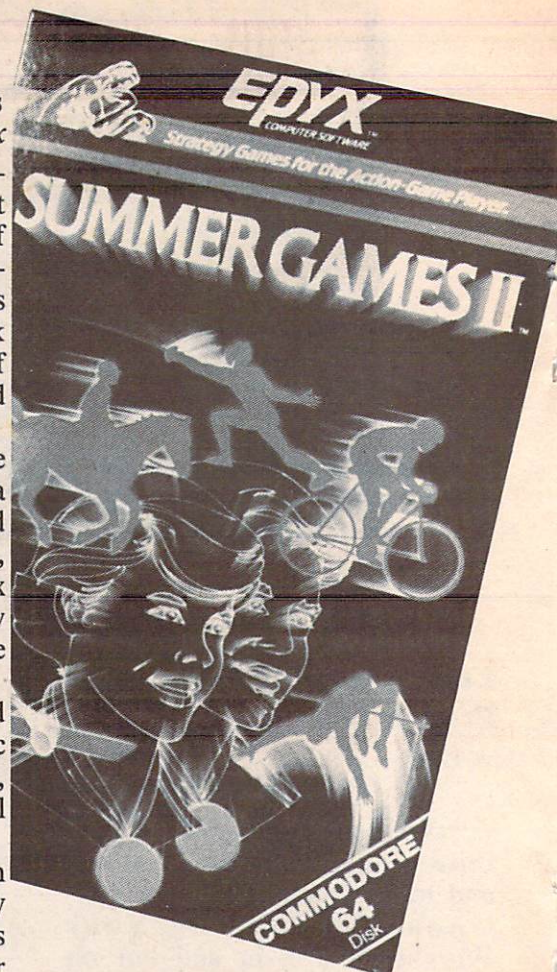
Summer, Winter & World Games
Epyx

A Game for All Seasons — that seemed to be the motto at Epyx over the past couple of years. The graphics were outstanding and, while some of the events weren't much more than joystick destroying, others were models of Commodore programming and laying.

Frankly, though, we were wondering just how much stamina these pixillated athletes could muster. After Summer Games II, was there anything that Epyx could concoct that would renew the Thrill of Victory and the Agony of Defeat?

And then came World Games. These events were esoteric — Caber Toss, Barrel Rolling, Cliff Diving — and the thrill still was there.

Spring Games, Autumn Games, Monday through Sunday Games, Midnight Games. This series could go on and on. To our surprise, we're looking forward to it.



Better Late Than Never??? Award

Spartan Apple Emulator

Once upon a time there were Commodore computers and there was no software for them. There were no disks to feed the then non-existent 1541 disk drives. There weren't even cassettes with which to feed the \$90 datasette.

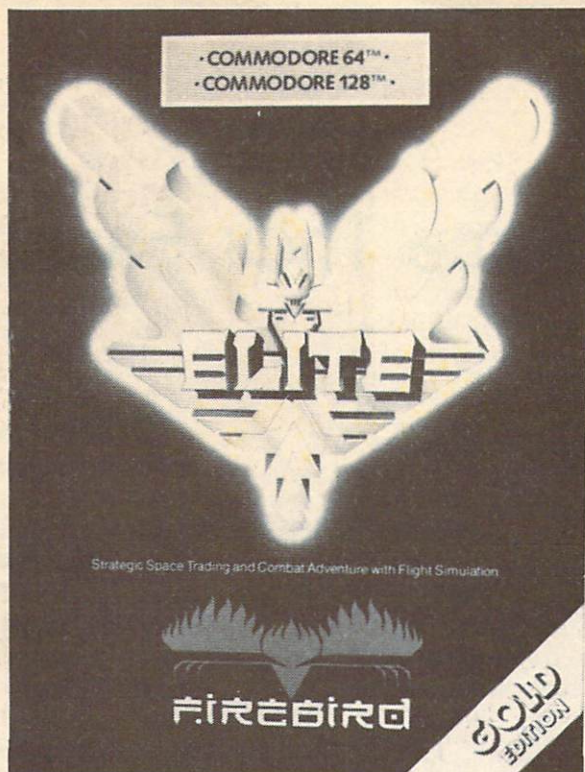
Somewhere, in that time of drought and famine, some delirious soul had a fever-induced vision of a Commodore world that allowed the use of all that *Apple* software. That poor chap told a

friend, who told a friend, who told a friend, and suddenly there appeared four-color ads in the Commodore magazines for a mythical product that would allow you to take a bite out of the big Apple and run those programs on your 64.

Appetites were whetted, fantasies stirred and the world went on as before. Eventually, that little Commodore was well provided for. A feast of software hors d'oeuvres were prepared and served making the C-64 the best-fed micro computer that ever lived.

That feverish dream lived on for a faithful few and almost four years later we find the Apple Emulator from Spartan actually available for \$300, not much less than the going rate for Apple II clones. And everyone seems to have forgotten just why it was they wanted it in the first place.

If only someone would develop an emulator for all of those poor deprived Apples that drool at the core when they look at the platters of disks lying on the Commodore's table!



Reader's Choice Award

Elite

Firebird

Perhaps it's just the collection of personalities that frequent our office, or maybe we were all too busy working to spare the time for Elite. But our readers, friends, writers, and acquaintances corrected us here.

By popular demand, the Reader's Choice Award goes to Firebird's Elite. Based on conversations, E-Mail, letters, and activity on bulletin boards and networks, the groundswell of public opinion seems to point to Elite as the game that captivated the largest number of Commodore owners this year. If that expression of support wasn't enough, one only has to look back over the best-seller lists of the year. This one was a hit.

THE LAST SPORTS GAMES YOU'LL EVER NEED!

"If you're looking for the most realistic simulation around, 3 IN 1 FOOTBALL should be your first draft choice."

- The Chicago Tribune

"[BASKETBALL is] another real winner from Lance Haffner ... a must addition to your library" - The Guide To Computer Living

Didn't like the way last season went for your favorite team? Here's your chance to do better as the coach. Or imagine the possibilities of dream matchups like the '72 Miami Dolphins vs. the '85 Chicago Bears or UCLA with Alcindor going against Patrick Ewing and Georgetown. How about the '86 Celtics against anybody? Now YOU can know the outcome of some of the greatest sports matchups that never were!

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- with Stats Compiler for each player and team • you choose from 14 offensive plays and 6 defensive formations
- includes 176 college teams, the 28 NFL teams and 14 USFL teams from the '85 season PLUS 174 great college and 189 great pro teams of the past

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- each player contributes as they did in real life • Stats Compiler • you determine starting lineup, substitutions, shot selection, passing, offensive and defensive styles of play and more • the College game includes 292 teams from the '85-'86 season plus 70 all-time greats • the Pro game features the 23 NBA teams from '85-'86 and more than 100 great teams of the past

OTHER PAST SEASONS' TEAMS DISKS AVAILABLE AND NEW SEASONS' READY PRIOR TO PLAYOFFS FOR ALL THREE GAMES.

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3 in 1 Football also available for
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Critics' Choice:

The Guide's Writers Name Their Favorites

Bob Lindstrom

Magazine deadlines being what they are, it is only mid-October as I'm selecting my Best of the Year choices. And Amiga software and hardware release deadlines being as flexible as they are, several key packages remain on the (undelivered) horizon including the long-awaited Genlock, Sidecar IBM emulator, Superbase and Deluxe Music.

Considering the remarkable sound and graphics of the Amiga, it is no surprise that games utilizing those sounds and graphics often took center stage in '86. Programmer Larry Reed and Electronic Arts showed the world what Amy could do with a stunning and stunningly faithful adaptation of **Marble Madness**.

Though Access' Leaderboard Golf Simulation had great graphics, Accolade's more challenging **Mean 18** grabbed my top golf honors. Also among sports simulations, Gamestar dribbled forward with **GBA Championship Basketball: Two on Two** and overtook EA's One on One for best Amiga basketball game. The strategic aspect of team play added a complexity missing in One on One.

Finally, the lovely, photorealist visuals of Activision's **Shanghai** set an elegant new high in Amiga graphics potential. And the game itself is a classic, the

kind that keeps you awake well into the night.

Music programs tended to be disappointing, led by the lacklustre Amiga translation of Activision's **The Music Studio**. I'll settle for a demo to show off Amy's noise-makers: John Molloy's title music, brilliantly realized on the Greengate DS3 System, for Firebird's graphic adventure **The Pawn**. This is the first peek at the future of digital sampling on the Amiga and a fine piece of music in its own right.

Exploitation of Amiga graphics far outdid Amiga sound in '86 with EA's **Deluxe Paint** and, especially, **Deluxe Paint II** getting my nod for the power and ease of its graphics tools.

On the other hand, in the field of moving graphics, the vast capabilities of Deluxe Video tended to be a bottomless (and bewildering) pit of features. Though less capable, I found **Aegis Animator**'s instant animation a more delightful way of moving Amiga graphics around the screen.

While we all waited for Amiga Live! to appear (sigh), **Digiview** knocked our eyes out with remarkable photographic pictures in low-res, hi-res and (most remarkable of all) in Hold-And-Modify mode. Easy to use and an inspiration to even an artistic novice (Think of the

possibilities!!), **Digiview** was one of the most exciting Amiga products of the year.

On the applications side, the database promise of **Datamat** lapsed into an awkward, conventional interface. I preferred the less ambitious **InfoMinder** which inventively melded outline processing and database management. It had a long way to go; but pointed confidently toward the future of Amiga applications.

For raw productivity, **LogiStix** gets my vote. Here, too, a product all but ignored the Amiga's menus and mouse. Still, the power and productive potential of **LogiStix** lifted it above the competition.

And, finally, with peripherals still priced in the stratosphere (those manufacturers ARE greedy, aren't they?), I should mention C Ltd.'s **AMega Megabyte Memory Expansion**. It works, it autoconfigures and it passes the bus through the board in anticipation of Sidecar and other add-ons.

Shelly Roberts

Oldies, but goodies. I've been at this long enough to have been around when today's flea market software sold for full price if you could find it. Sometimes just hanging around long enough makes you an expert on which ones to retrieve from the bargain

box. So here are my nominees for the can't-be-withouts:

Commodore's **EasyScript** was the first best word processor and is still, in my opinion, the last best word processor. I have tried, or reviewed nearly all the word-processors produced for the 64, and I still stick with EasyScript. It holds and easily links very large files. It is extremely flexible. It has a companion spell checker (separate purchase, unfortunately) that does in-text correcting and tells you the number of words in your file(s) and the average length of the words.

The program can be learned from a clearly written tutorial in just a few hours, and the more sophisticated commands are masterable as the needs arise.

I use **WordPro64** whenever I need to have my output in double columns. It has a built-in command that creates double columns automatically, so books and newsletters are child's play. Unfortunately, you have to master the entire program just to get this feature, but if you need it, it's worth it.

GeoWrite (Berkeley Software) comes on the GEOS (Graphics Environment Operating System) disk. I have just begun to play with it, and am intrigued. It allows you to see onscreen exactly what you will be getting on paper. Whether you are using a dot matrix or laser jet printer, you can change fonts in mid-sentence. With the additional font disk, you can have your choice of about 25 different type faces in various point sizes from a low of 6 points to a high of 36 points. You can also take any of the fonts and italicize, embolden, outline, underline, or almost any combination of all four.

Drawbacks: The files are **USR** files, and therefore not transferable to most other word processors. The system is icon- and menu-driven using a mouse or a joystick, and that can be slow.

In the database category, **Superbase64** (Precision Software) is the winner, hands down! Flexible, complicated, and so versatile it has a high level programming language all its own. You may never master all of it, but what you get, you use. And what you need, you figure out.

Among maze games, **Sword of Fargoal** (Epyx) was an early winner. Fifteen to twenty levels are newly generated each game. Don't get this unless you enjoy games that can take six hours to frustrate and amuse you. I have been playing this one for several years, and it is new and engaging each time. Be warned, though. Every time I haul this one out to play, I can almost always be sure the adventure will end with my saying, "I will never, never, EVER play this game again!!!" But I always do.

SubLogic's **Flight Simulator** is not a game, it's nearly an FCC accreditation. If you always thought that you were going to learn to fly one day, this complicated and fun program will get you started. There are lots of scenery disks, so you can practice flying around lots of US cities, and a few foreign countries, landing and taking off from their airports.

Michael J. Henry's **Fast Hack 'Em**, still seems to be the most powerful program for archiving your unprotected and many protected disks. I recommend it.

Thomas Templemann is responsible for the breakthrough **4 minute copy** program. He now has a 70 second copy program. I recommend nearly anything you can find by the brilliant Mr. Templemann.

There is only one **CAD GEM** from Micronics Interface Technology. Created by Wesley James, President of both MIT and the New York City User Group, CAD GEM does what technically can't be done on a 64. He simulates, and, in fact, beats,

computer aided design machines costing tens of thousands of dollars. If you need CAD, get CAD GEM.

William B. Sanders' book **The Elementary 64** (Datamost) is everything that the manual meant to mean only in understandable English. A Must Have.

Mindy Skelton's **The 1541 Survival Guide** (Stoneridge Publishing) is everything that the disk drive manual meant to mean, only in understandable English.

What you need to know to live with your 1541 is in **1541 Revealed** by Felix Rivera and Evelios Quiros (Write Protect Publishing). I liked it so much I decided to publish it. The editors of Transactor loved it, too.

EasyScript Simplified by Linda Levin (Write Protect Publishing) is a great tutorial. And all the ES commands are detailed in a way that makes them simple to find. I liked it enough to publish this one too.

I'm Sorry But I Don't Speak Hexidecimal by Shelly Roberts (Write Protect Publishing) is the funniest book ever, EVER, written about the 64. Since I'm both author and publisher, it's a biased opinion, but I liked this one a lot, too.

Mindy Skelton

The hands-down, best word processor for the C-64 is **Font Master II** (Xetec). I know there are more powerful processors that do more but this is my favorite. I like Font Master II not only for its ease of use; on-line help screens; and a well-written, comprehensive manual; but also for its power and its *range* of options. The number of commands may seem overwhelming, but will, in the end, give you a unique control over your output (which is what it's all about).

Last, but certainly not least, I like this program because it's *fun*. I continue to get a kick out of seeing the output which results from

using Font Master II's lovely built-in fonts and its easy-to-use font designer/editor.

As I am not much of musician (major understatement), I have never been able to enjoy the wonderful music programs offered for the Commodore family; but that is now changed. Thanks to **Instant Music** (Electronic Arts), I am now quite a musician. This wondrous program provides you with enough built-in tunes to let you sample most of the available styles of music, from classical to jazz, reggae to folk.

You choose your tune, Instant Music loads your selection and serves it up to you in four-part harmony. You can elect merely to listen, or to control any of the four instruments, or substitute one or more from a sizeable list of instrumental options — including the hilarious Do Voice, a 50's throwback not to be missed.

Now for the part I like: you cannot make a mistake. Instant Music makes sure the rhythm is right, the notes tuneful, the key correct. You literally cannot do anything but play well. Yea!

Everyone has a bundle of favorite games and here are some of mine:

With **Leather Goddesses of Phobos**, Infocom has done it again! LGOP combines humor, sex (oooh!), puzzles, tricks, 3-D comics, and scratch and sniff scents into one of the most enjoyable games of this or any other year. Mildly titillating, always intriguing, frequently frustrating; it's one of Infocom's best.

I don't usually care for graphics games, but **Marble Madness** from Electronic Arts (the Amiga version especially) had such wonderful graphics, music, animation, and major league arcade action that I make an exception. I'm no good at this game myself, but I love to watch talented friends whip through the screens. Nice job!

I just love Telarium's **Nine Princes in Amber!** Well written, beautiful music, nice graphics, multiple endings. Go back and read my review of this one in the June 1986 issue. Did I mention I love this one?

Tass Times in Tonetown (by Activision for the C-64, Amiga) may be the first punk rock game for the Commodore. Interesting graphics, keyboard or joystick input, a cute animated opening with punk music, and enough puzzles to keep you interested. A nice, crazy adventure and thoroughly entertaining.

Robert J. Sodaro

My first choice is for **Robot Rascals** from Dan Bunten and Alan Watson, (Electronic Arts). Combining the luck and gameplay of card games with the fun of a computer game, Dan and Alan have moved card games into the hi-tech 80's. (For a more thorough description of this game, refer to my column elsewhere in this issue.)

Not quite a game is EA's **Mind Mirror** from fellow *Guide* columnist, Dr. Timothy Leary. With this product, you can run through your first day in grade school, or go right back to the moment of your conception. Or you can choose to speed ahead in time to choose your career in films or literature.

You are in control. Bounce your thoughts off the CRT, the fireplace of the 80's. No need for barriers with this product, and if you have any, Leary built in "Mind Bombs" that will shatter your defenses.

From Woodbury software comes the **Playwriter Series**. These products ("Castles and Creatures," "Mystery," and the rest) are not only great creative writing tools, but a fun way for a person to write, illustrate, and publish their own line of books.

The user is led through each chapter of the book answering questions and supplying details.

After this, they can edit or alter the facts and dump them to specially-sized printer paper, and, finally, bind it together with stick-on illustrations. Altogether, an innovative product.

On the joystick front, there's the **500XJ** from Epyx. This unit (right hander model only) is the joystick for action/arcade gamers. Certainly the best one I've ever used in the four or five years I've been gaming. Fast action, smooth handling, and quick firing, this one has everything that a gamer needs to play for hours.

Two more games are **The Pawn** and **Frankie Goes to Hollywood**, both from Firebird. Frankie is reviewed at length elsewhere in this issue, so I'll concentrate here on The Pawn, which is a graphic text adventure with an amazing parser, dynamite graphics and a very good fantasy storyline. The 64 graphics are very good, you'll be quite surprised.

CBS Interactive Software gets the nod for innovative programs like **Keys to Responsible Driving**, and **The Body In Focus**. These programs deal extensively with automobile safety and the human body. Still, they are every bit as fun and enjoyable as normal gameware.

In Hardware, I pick **Device One** from Progressive Peripherals and Software. This parallel printer interface has 16K of ROM, 16K of RAM, three built-in fonts, plus the ability to print custom fonts, pictures, calendars, banners.

You can design letterheads with any graphics program, then use Device One to dump the picture onto the top of a page, or as a halftone under the text of the letter. As an added attraction, the designer built in the ability to print out banners and a perpetual calendar — both of which can be addressed from BASIC.

Habitat:

The Gods of Lucasfilm Create A New QuantumLink Universe

by Shelly Roberts

The trouble with computer games has always been that, no matter how engaging the game, it was essentially a closed system. While the graphics might have been good, what surprises there were, were programmed in, and once you learned the pattern, the surprises weren't surprising any more. The game quickly got boring.

As computer entertainment, telecommunications networks had the advantage of unpredictability, particularly in chat mode. While there were as many surprises in chat mode as there were people logged on, the graphics were always the same. Letters typed on a screen. Also boring.

Take heart all you yawnstiflers. QuantumLink has broken through the boredom barrier with an innovative programming idea that gives you all the excitement of the best computer games, and all the interaction and surprises of the best of the telecom systems.

The solution is **Habitat**.

Habitat is a fully interactive, graphic society peopled by characters called avatars. Habitat is a new feature of the QuantumLink network, created for Q-Link by Lucasfilms, Inc. Avatars are animated graphic folks created by the Q-Link subscribers who are online.

When you log on, and are cleared by the quantum mainframe, you are given a chance to

enter the Avatar domain. The first time into the domain you create your character. You choose the gender, the general body type, and pick a head for your character. After you are done with the design, your personally crafted, animated avatar (who carries your screen name or the name of one of your online alter egos) is given a piece of turf.

Turf, in this case, is not a hunk of grass that horses run on. Your turf is a house which you can decorate, furnish, invite other avatars into, and/or leave at will. Where you go when you leave is up to you. You can go to the store, the newsstand, explore the terrain within the city or out of it. You can interact with other avatars in real time. You can go off on your own or with an adventure team in search of treasure. You can get mugged for your tokens. You can start a religion. You can . . .

You can . . . You can . . .

Almost anything you can do in a real life society, you can duplicate in the Habitat.

The electro-geography is designed to resemble a city with room for 10,000 inhabitants. When that city is full, there is room for enlargement. Other cities can and probably will be created. The electro-geographical potential is enormous.

So, too, is the sociological potential. Right now, Habitat is a totally blank slate. There are no laws and only a few rules. There is

no structure, only houses and adventurelands waiting for inhabitants.

Will Habitat become a boom town with high ideals, high employment and high moral principles? That's up to you. Will it become an evil, vice-filled urban terror center? Up to you. You can make it what you will. You could start a police force or a gang. You could start a government or buy the one that's already started.

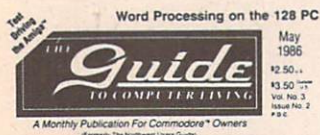
Habitat is the most innovative and enticing turn the computer has taken recently. You will want to be part of it. You will want to explore it. You will want to help define it. You will not, most likely, want to pay the bill.

It costs 6 cents a minute to be on Q-Link. It doesn't cost any more than that (or so they have thus far promised) to be in the Habitat. It's just that you will want to be in Habitat all the time. And at six cents a minute, time is money. So you may soon have to learn the art of compu-budgeting.

But in spite of the cost, I know that I will be there. I want to see what happens.

If you haven't been bitten by the telecommunicating bug so far, Habitat is a great excuse to buy a modem. There are plenty of simple modems on sale and closeout so the initial bite could be as low as \$19 through C.O.M.B. or other liquidators. Your avatar can't leave home without it.

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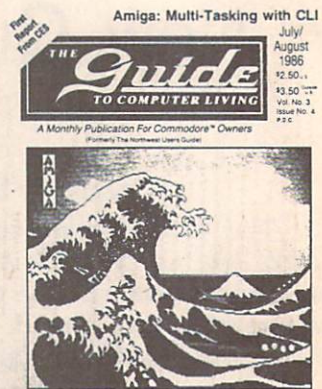
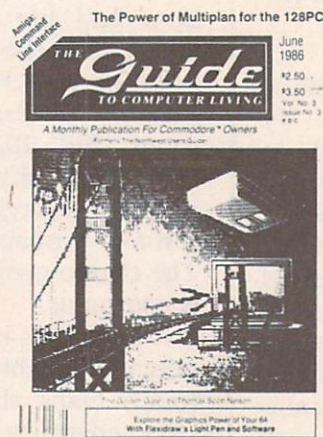
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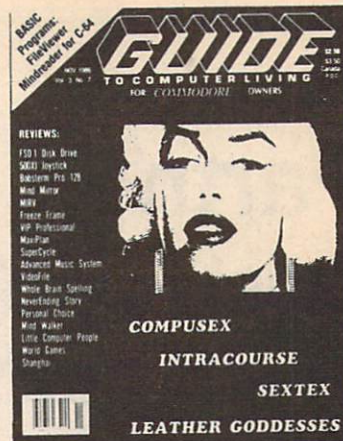
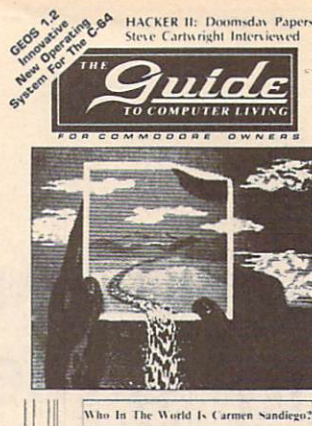
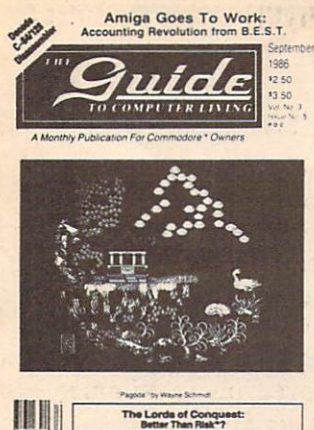


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Partner 128: Desktop Accessories Are Too Often Silent Partners

by Bob Lindstrom

Notepads, calculators, address books, zip code look-ups, area code look-ups, alarm clocks — Apple's Macintosh computer made the world crazy for desk accessories. No matter what program you were running, the Mac allowed you to pull down a menu and instantly whip out a piece of computerized scribble paper or add up a series of figures on an onscreen calculator.

The Mac made access to these gizmos so convenient that soon owners of other computers decided that they, too, should be clearing their desks and cramming their computers. For the IBM-PC, for instance, a wide variety of add-in utilities appeared to tuck a calculator, key macros, thesaurus, database and spell-checker into the recesses of the PC's copious (we thought) 640K memory.

Suddenly, all the pocket calculators and scratch pads that once took up space on a desktop were now taking up space in a computer. And if you thought the desk was a mess, get a gander at that RAM. Some utility-crazed IBM-PC owners filled their systems with so many useful gadgets that there was precious lit-

tle room left for programs. The concept that was supposed to bring the crowded desk to an end just pointed the way to a dead end.

A Better Idea

Well, Timeworks was not going to let that happen to the Commodore 128. Rather than pack the

C-128's memory with a clutter of accessories, Timeworks' Partner 128 politely tucks those add-ons into a cartridge. With Partner 128 installed, all you need do is press the button on the cartridge while you're running any other program. A menu breaks in offering your choice of an appointment





calendar and date book, memo pad, phone list and autodialer, address list, calculator, label maker and screen printer.

That's a lot of extra tools to add to a 128; but, because they reside discretely on a cartridge, they don't put a burden on the system memory. Plug in Partner 128 and turn on your machine. The sizeable memory of the 128 remains very much intact.

Port Hog

Although the Partner 128 is easy on memory, it is piggish on ports. In addition to taking up the cartridge port on the back of the 128, which instantly makes Partner 128 incompatible with VizaWrite and any other cartridge-based program, the program plugs into Joystick Port Two. Ooops, there goes another port.

Loss of the joystick port can be tragic for programs that are dongle-protected. The popular PaperClip word processor, for instance, uses Joystick Port Two for

its copy-protection dongle. If the program doesn't detect that pirate-fighting little circuit on port two, it won't boot. It doesn't take a silicon-savvy engineer to realize that if Partner 128 occupies port two, a copy-protection device cannot.

Timeworks fortunately proposes a simple solution (that will cost you a few more bucks, natch). Buy a port splitter, a cable that turns one port into two ports. It will provide a place for Partner 128 and for the dongle. But, don't bother until you've checked Partner 128 with your own software. There is a chance that Partner 128 isn't going to work with your application, port or no port, dongle in or out.

Hostile Partners

Timeworks solved the memory problem, even gave clever programmers a way to squeeze their own accessories into some spare space in Partner 128. They did not, however, completely solve the problem of incompatibility.

Since desktop accessories were an integral part of the Macintosh operating system, those Mac calculators and notepads were well-behaved. Poking background goodies into an IBM-PC, however, took some doing and often proved the undoing of foreground programs. Running a word processor was fine. Call up an accessory and there was a chance that the entire system would lock up because the little guy unexpectedly did something that the big guy didn't like.

The solution? In the best arcane tradition of Big Blue, the solution was yet another program. This one was a watchdog program intended to make sure all the other programs played by the rules. Programs on top of programs. All jockeying for attention. All threatening one another as well as the incredible shrinking RAM of the PC.

It is unfortunate that Partner 128 succumbs to some degree to these same incompatibility problems.

First of all, Partner 128 is specifically for the C-128 in 80-column mode and will not work in C-64 emulation mode, or with the 128 in the 40-column mode. So forget that right off the top.

Then, it will not always work to full capacity. If a disk file is open, for instance (which happens virtually every time you load a word processor or database), Partner 128 will not allow disk access for fear of corrupting the data already on the screen. Though you may be able to access many of the Partner 128 features, you won't be able to load from or save to the disk. Since the phone and address lists reside on a disk, those features and several others virtually are useless in this all-too-common situation.

Timeworks does indicate a key combination that will enable

Partner 128 to work with some programs that impolitely dominate disk access. They do warn, however, that using the key may cause data loss.

BobsTerm Pro 128 is protected with a dongle in port two so, according to Timeworks' instructions, I got a port splitter, hooked it up and, wonder of wonders, BobsTerm booted right up, no problem. The bad news is that Partner 128 wouldn't work. The initial menu was garbled, along with everything else in the cartridge.

So, if you want to use Partner 128 with most word processors, there is no problem, just as long as you are ready to test for data loss by overriding the disk access lines or if you don't mind saving the text file in progress before you access any accessory. Of course, the second option means stopping work to use Partner 128 and defeats the purpose of accessories that are supposed to run concurrently with your software. But your desk looks clean, doesn't it?

What It Does When It Does It

Should you be fortunate enough to have Partner 128 work as intended with your software, here's what it does:

An appointment calendar provides a calendar display for every month until the end of the century. Users can page through on a monthly or semi-annual basis until they find the day, month and year they desire. Hit RETURN when you have positioned the cursor over the appropriate day and Partner 128 brings up another screen with spaces for a title, a list for five Key Tasks, a five item To Do List, and space to enter an appointment schedule. Entries can be saved to a Partner 128 data disk and saved indefinitely.

Memo Pad is a simple word processor that allows deletions and text searches but no text moves, cuts or inserts. Memo Pad

texts can be printed or saved to disk. Also Memo Pad can turn your computer and printer into a typewriter. Every time RETURN is pressed, the Memo Pad typewriter will print the entire line the cursor is on.

The Address/Phone List and Auto-Dialer does just what the title says. It maintains 60 names, addresses and phone numbers (capacity could be a problem for those with LOTS of friends).

gram are friendly enough to allow access to the disk drive.

A unique and inventive feature of Partner 128 is the **SwiftLock**. This option lets you assign a five-character password to the computer when, for instance, you're going away from your desk. Until that password is typed accurately again on the keyboard, the entire system — computer, disk drive, keyboard and all — is locked tight and

“... all you need do is press the button on the cartridge while you're running any other program. A menu breaks in ...”

When used with a modem, Partner 128 will automatically dial the numbers. However, you must have a second phone connected to the line independent of or ahead of your modem. My desk phone is connected “upstream” of my Hayes-compatible modem via a feed-through connection on the modem itself. By configuring Partner 128, I had no trouble getting cartridge and hardware to work together. But when the connection was made, the modem refused to give up the line to the telephone connected behind it. Partner 128 made the call but I was unable to talk on the line.

Admittedly, this represents a specialized problem. Yet it also indicates that usage of Partner 128 can be besieged by such specialized problems.

A Calculator brings up (what else?) a calculator that can spool out a paper tape to the printer. The **Screen Print Option** provides a screen dump to the printer and a **DOS/Printer Commands** mode offers access to DOS commands when Partner 128 and your pro-

responds to nothing. This keeps office mischief-makers from diddling with your data while you've stepped out for a Coke.

Bad Neighbor

If Partner 128 worked more consistently with programs, its array of features would make it a must-buy for C-128 owners. For those who use programs that are totally compatible with Partner 128, this desktop accessory cartridge is highly recommended.

Yet, I found that Partner 128 had minor or major problems with such bread-and-butter C-128 programs as Superscript, Superbase, PaperClip, BobsTerm Pro and a handful of others. At the least, it would seem that Timeworks would want to make their add-on product compatible with the most popular C-128 productivity software.

In some cases, Partner 128 will be a real asset to a C-128 system. In too many cases, it is just another poor reason to use up a cartridge and joystick port.

■

KrackerJax:

Software Series Strips Copy Protection

by Grant Johnson

Feelings can run hot on the subject of copy protection. Programmers, and the for which they work, employ copy protection in an effort to secure enough control over their products to secure a fair return on their development investments.

On the other hand, users understandably worry about the durability of the software they laid out hard cash to purchase.

Vendors offer back-up copies at a "nominal" cost. Purchasers counter that the two weeks they wait for that back-up to arrive could be disastrous and that the cost of the product might be small compared to the time and effort they have invested in its use. Besides, if the disk wasn't "sabotaged" with tricky disks maneuvers the back-up would never be needed.

Wherever you stand in this debate (just be sure to duck if it's in the middle), the decision to copy protect disks currently is made by businessmen who believe that the revenue they get on protected products is worth the consumer inconvenience and resentment.

And the cheapest method of protection for both producer and consumer is disk modification: bad sectors, half-tracking, fat-tracking, illegal track numbers, custom load sequences and many

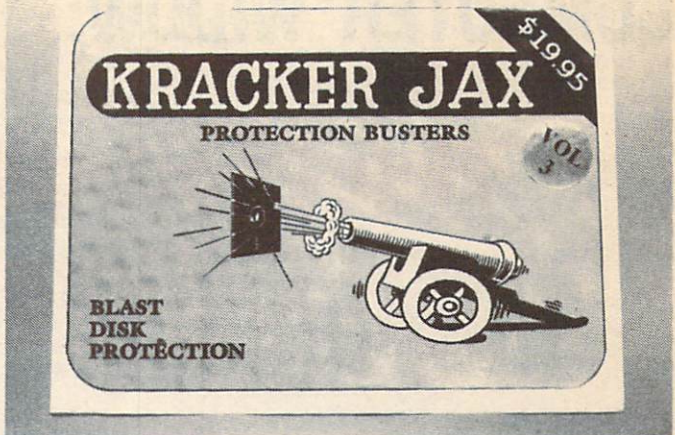
other perversions of the world according to DOS.

Computer owners have not been entirely passive on the issue. Nor have they been without champions — those with the time, interest and talent to work their way around protection's obstacles. A few in that vanguard have gone so far as to market software products that overcome copy-protection obstacles.

One type of product allows the user to clone an identical copy of a protected product which reproduces all the disk data as well as the copy-protection. Cloned software may be immortal, but it still embodies all of the protection's other unpleasant side effects — drive alignment is imperiled; loading is slowed; and programs are inaccessible for modification.

A recent approach to commercial anti-protection software is represented by the Kracker Jax series of disks. Each one of these disks (there are three at this writing) contains 80-100+ BASIC programs, each of which is designed to *remove* the copy protection from a specific product.

Using Kracker Jax is a two-step process. The first step is to make a "Three Minute Copy" of the original. A special menu-driven program for this purpose is included on each disk. That copy contains all of the DOS-legal data from the original.



The next step is to load a program designed to remove the protection from the product you just copied. RUN it with the copy in the drive and Kracker Jax creates a non-copy-protected version.

Most of these programs are quite short. The longest runs to less than 7,000 bytes.

The result is a program disk that is error free, will work with most fast load schemes and even can be copied with ordinary disk commands. And I now have reasonable access to the code in order to change screen colors or set up a non-standard printer for an otherwise much-loved program.

The Jax disks are not copy-protected and, aside from the Three Minute Copy program, the Jax programs can all be listed, if you're curious. There is also a companion book available, *Kracker Jax Revealed*, that reads like a file of case studies and sheds light on how the programs work. Some knowledge of machine language will be required for a full understanding of the book.

A final warning, owners of 1571 disk drives should be aware that I had trouble RUNning the Three Minute Copy program with the 1571. All the programs I tried on a 1541 worked exactly as advertised.

COMPUTER WIDOW:

The Incredible Growing Computer

by Lyn Chase

About four years ago, Randy decided that he could not live without a personal computer — a startling decision from a man who used to fold, spindle and mutilate the electronic punch cards that came with electric bills before the advent of the superspeed Motorola 68000 chip.

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After a few weeks of, "But dear, we have no money . . .," we ordered a Commodore 64. When the day to pick it up arrived, I wondered if the car would be big enough to hold it. After all, it cost \$595. And that was just the computer. The disk drive and other paraphernalia were not yet available. When the man presented us with one lowly box which weighed all of four pounds and I found out what we were taking home for our hard-earned money, I was disappointed. And irritated.

Not long after that, the truth became known. I found out about "peripherals".

When we brought the little bundle home, we made space for it in the upstairs area of the house, Randy's office. It housed his other toys: a 4,000 album record collection from his disc jockey days, a fairly large book collection from a lifelong love of reading, and every piece of paper anyone ever sent to him including receipts, junk mail, letters, and notes scribbled to former "significant others".

The computer nestled into this collage of Randy Interests and I became a Computer Widow. Because we did not yet have a disk drive and cartridges were not yet available, Randy was reduced to typing in programs and leaving the computer "powered up" for weeks on end because he had no way to save the data he'd entered.

Some months later, Jonathan was born and Randy wanted to be nearby so he could watch the baby learn to smile. Since virtually all of Randy's free time was spent at the keyboard, the computer moved into the living room. But by this time, of course, computer peripherals and supplies had entered the picture. One wall of the living room was filled with the computer, disk drive, power supply, television monitor, joysticks, disks, disk jackets, and the ever popular Flip 'n' Files. The living room decreased as the computer room increased.

For a brief period of time, it lived on the dining room table, but it moved back upstairs when Randy decided to begin publishing a newsletter for Commodore computer users. Soon, there was another computer around for the increased workload. Then Jonathan acquired a Muppet Learning Keys. Of course *he* had to have a computer at his disposal once he had the Muppet pad so another computer came into the household; but this one stayed in the living room. I was forced to learn to load the software required to use the Muppet pad and I became a Computer Mom.

The newsletter turned into a magazine and Randy began acquiring software. Under normal circumstances, software comes on flat disks and the written instructions often have fewer words than

the campaign literature distributed by candidates for county surveyor. But the packaging for the software is big, bulky and non-collapsible. Its sheer mass seems to increase its value to the hacker. The disk and instructions rarely find their way back into the packaging as piles of plastic boxes begin to appear.

Randy's office was no exception. Considering his penchant for saving every gum wrapper he ever met, it was inevitable that available space would diminish in direct proportion to his interest in computing. Computer magazines began to pile up — the ones he published and the ones he bought. Boxes from new equipment could not be discarded. After all, if equipment needed to be transported anywhere for any reason, it had to go in the original boxes. Here again, computers are little but the boxes are big. This applies to printers and their boxes, disk drives and their boxes and, certainly, monitors and their boxes.

Then, of course, there are boxes from blank disks which cannot be discarded because they might come in handy, so they are being nested for safekeeping inside the cardboard boxes from Flip 'n' Files. This cardboard does not find its way to the trash can because the trash can can no longer be located.

By the grace of God, Jonathan's computer area in the living room has remained constant. It has the basic equipment on a large desk and a few small boxes of disks nearby. Jonathan has not yet learned the joy of acquiring computer peripherals. But Randy's office is disappearing in a sea of computer-related junk. There are a few Commodore 64's, a portable (?) 64SX, a couple of Commodore 128's, an Amiga with an extra disk drive and a mouse (complete with mouse pad and mouse house). There are big disks and little disks. There are big disk holders and little disk holders.

And there is Randy who sits glassy-eyed in the middle of it all.

But there is a saving grace. Amidst the computer-generated chaos lies a music book — "Creedence Clearwater Revival Complete". The presence of this book brings back memories of our early, neater days together and offers me reassurance that Randy hasn't forgotten what life was like B.C. (Before Commodore).

Perhaps he remembers that people used to play Scrabble on a game board. Maybe he still has memories of manual typewriters. Seeing this book is good evidence that he remembers that people used to play music on guitars and pianos instead of hitting keys and watching notes dance across a monitor. Perhaps one of these days in a flash of inspiration, he'll "power down" the computers, straighten up the place and plug in his guitar.



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LogiStix:

Another Contender in Amiga's Spreadsheet Sweepstakes

by Bob Lindstrom

With three solid products already on the market, the Amiga is not wanting for spreadsheets in a variety of flavors. There is the plain vanilla spreadsheet (Analyze!), the Lotus 1 2 3 taste-alike (VIP Professional) and the all-Amiga spreadsheet (MaxiPlan) sugar-coated with colors, pulldown menus and mouse support.

The latest taste treat for spreadsheet gluttons is LogiStix, a combination spreadsheet, database, graphing, and time management and scheduling package created by Grafox of Great Britain and published in this country by Progressive Peripherals and Software (\$249.95).

At that price — reasonable for business software but at the high end of the Amiga price scale — LogiStix is not going to be a casual purchase for Amiga owners. But then, LogiStix is not a casual program.

Previously available in an IBM-PC compatible version, LogiStix for the Amiga reflects the controls and techniques of the IBM more than it does the user interface of the Amiga. Though it

will work in the Amiga's multitasking environment (I don't, however, recommend using it that way unless you have a memory-expanded Amiga), LogiStix does not make use of the Amiga's special features. You'll find no pulldown menus, no mouse control, and only limited windowing. The program is keyboard-driven throughout with onscreen command lines and online help files leading you through the multifarious capabilities of the system.

Without the glamour of the Amiga behind it, LogiStix comes off as a hardcore piece of business software. And a powerful piece of business software, at that.

Compatible With The Biggies

Users who have already committed their data to one of the major IBM-PC spreadsheets will be relieved to know they do not have to re-key their data into LogiStix, should they take the Amiga plunge. Assuming you can get the datafiles into a form readable by the Amiga (perhaps using the 5.25-inch disk drive to transfer files to 3.5-inch disks), LogiStix will accept datafiles from Lotus 1 2 3 and Symphony, dBase III,

SuperCalc, WordStar text files (into Column A of a spreadsheet), CSV (comma separated value) files, and DIF (Data Interchange Format) files.

Even when the data has been transferred into a LogiStix spreadsheet or database, there still remains the task of indoctrinating the human operator to the new system. Here, too, LogiStix has done well. In many cases, LogiStix commands are similar to SuperCalc and Lotus 1 2 3. So similar, in fact, that the experienced Lotus user should be able to start up with LogiStix after a quick glance at a command comparison chart provided in the Users' Manual.

As an additional advantage, a utility that imports Lotus 1 2 3 files to LogiStix automatically translates expressions, and column formats in cases where LogiStix commands differ from Lotus. When there is no LogiStix equivalent for a command, the program loads those expressions as text, ready for user editing.

Three different versions of the LogiStix program also offer compatibility with future Amiga systems. The file on the program disk is designed to run on a minimum 512K RAM Amiga (the

program will not run on 256K machines) in the non-interlaced graphics mode and displays 20 rows onscreen. Grafox recommends that users avoid Workbench and load this program from a CLI window for an extra 20K of RAM. When loaded from CLI, the program allows about 90K for the worksheet. In order to be more memory-efficient, this LogiStix accesses some commands from disk only when they are needed.

A second version of LogiStix, contained on a supplied Examples disk is designed to run in non-interlaced graphics mode on an Amiga with one megabyte or more of RAM. This version boots the entire program into memory at

A lengthy addition to the manual details bugs in 1.1 of which owners should be aware while using LogiStix. What that addendum doesn't say is that LogiStix, running with 1.1 operating system software, can try the patience of even the most low-key spreadsheet hacker. With 1.1 LogiStix disk access is slow, calling up an information file drags on interminably. And when I called for a disk directory (which prompts LogiStix to open a new CLI window), LogiStix gave me a CLI window and immediately locked up. In short, LogiStix won't be a fully operational, fully useful program until 1.2 is readily available.

The most dangerous problem involves running out of memory

columns by 2048 rows; not the largest in the business but sufficient in most cases. Data in cells can be a number, expression (or formula), date, text, repeated text, a graph command or time command.

As in other spreadsheets, the cell itself displays the data while a command line beneath the worksheet contains the formula or expression, if any, behind the value. Those formulas may refer to other cells by number or by names which LogiStix allows you to assign to cells.

For instance, instead of referring to cell C4, it might be easier to assign the name "Construction Cost" to the data in that cell, and refer to it that way throughout the worksheet.

“... At that price . . . LogiStix is not going to be a casual purchase for Amiga owners. But LogiStix is not a casual program . . .”

once, which eliminates disk-accessed overlays and speeds operation.

A final version is designed to operate on memory-expanded Amigas in the interlaced, high-resolution 640×400 mode. In addition to working without disk overlays, the program displays 44 rows onscreen at once.

Worksheet

With the 1.2 version of the Amiga operating system on its way Real Soon Now, it is comforting to know that LogiStix will work with the OS update. Using a beta test version of 1.2, LogiStix boasted fast disk access and rapid calculations.

on a particularly large spreadsheet, a fatal occurrence in 1.1. Grafox optimistically assures the reader that 1.2 will correct the problem completely and provide a warning when a user has ordered an operation for which there is insufficient memory. Although the insufficient memory warning saved me on one occasion from over-extending a 512K system, on another occasion I managed to crash the system just after the warning was issued. Users should take seriously Grafox's warning to save all data when there is only 25K remaining in the system according to the memory use counter at the bottom of the worksheet screen.

All LogiStix operations take place on the worksheet, up to 1024

Text And Formatting

In some spreadsheets, entering text titles can be a pain. The user has to format a single title across several cells if a long line is to be seen in its entirety. If a text entry exceeds the width of a LogiStix cell, the program expands the cell to display the entire text, assuming that the cells to its right are empty. As long as there are no filled cells in the way, LogiStix will display a text as long as needed.

The formatting commands, mathematical operators and cursor controls commonly found in spreadsheets are present in LogiStix. Operation is fast and efficient. A spreadsheet of 2128 cells, most with their own formulas, occupied about 64K in the machine and took under 10 seconds to recalculate. A spreadsheet of 1612 cells with a greater variety of mathematical operations took under 20 seconds to recalculate.

Database

In recent years, programs such as Symphony and Reflex have demonstrated the conve-


```

1 HOUSE IMPROVEMENT: A SIMPLE EXAMPLE OF LOGISTIX
2 -----
3 SKILL COST PER DAY
4 Laborer $65
5 Plumber $85
6 Carpenter $75
7 Painter
8 -----
9 JOB SKILL COST PER DAY LENGTH COST PER JOB CODE
10 Build stairs Carpenter $75 6 BLDS
11 Fit cupboards Carpenter $75 3 FTIC
12 Fit pipework Plumber $85 2 PIPE
13 Paint cupboards Painter 3 PNIC
14 Paint stairs Painter 4 PNTS
15 Rads and boiler Plumber $85 3 RADS
16 Tidy up Laborer $65 2 TIDY
17 -----
18 TOTAL:
19 -----
20
80K D5(TEXT,P)= THIS IS THE DATABASE
ENTER: Use arrow keys to move around, HELP(F1), or one of the following:
+Expr "Text" Rpt ,Graph (Time /Cmd =Goto !Recalc ;Jump

```

nience of the spreadsheet layout of column, rows and cells for database use. Though the concept does not allow for the flexibility of a full-fledged relational database system, the ability to link spreadsheet and database information can provide a degree of convenience and integration that compensates for the limitations.

LogiStix provides a wide range of sorting commands and Table Query options to arrange and locate data in a database section of the worksheet.

Fields are entered in the first row of the worksheet database, field names in the first column. Each subsequent row constitutes a record. The user may define up to 64 fields and create up to 2047 records per database.

In a database, the user has complete access to all LogiStix mathematical and logical operators such as AND, OR and IF.

The database may be sorted according to a KEY column. A worksheet database of prices can

be sorted according to price, highest to lowest or vice-versa; or addresses may be sorted alphabetically according to name. In order to sort on several fields, however, the user must do several sorts. For example, a common sort of a phone list might require a sort on last name, then on address, then on city.

One unfortunate outgrowth of AmigaDOS' strange wildcard arrangement is that LogiStix offers limited wildcard support. While not such a drawback in spreadsheet operations, this eccentricity is a considerable drawback when searching a Worksheet database.

Graphing

A wide variety of graph types are available to display data in LogiStix spreadsheets and databases: Pie graphs, tables, bar graphs, line graphs, scatter graphs, stacked bar charts, clustered bar charts, step graphs, spread graphs and, for the time management data, Gantt charts.

COMPARE

x = included
- = not included

C64COMAL 2.0	C64COMAL 0.14	C64 BASIC 2.0	
			=SPRITES=====
x x	-	-	Keywords for defining sprites
x x	-	-	Keywords for setting sprite color
x x	-	-	Keyword for moving sprites
x x	-	-	Built in collision detection
x -	-	-	STAMP sprite image onto screen
x -	-	-	Animate sprites, interrupt driven
x -	-	-	Attach sprite shapes to programs
			=GRAPHICS=====
x x	-	-	Turtle graphics and X/Y graphics
x x	-	-	Hi-res or multicolor graphics
x x	-	-	Split screen (text/graphics)
x x	-	-	Background/border color keywords
x x	-	-	Mix text and graphics on screen
x -	-	-	Graphics text in any size
x -	-	-	Graphics text sideways
x -	-	-	Save a graphics screen to disk
x -	-	-	Window capabilities
x x	-	-	Line clipping within frame
x -	-	-	ARC and CIRCLE commands
x x	-	-	FILL command
x x	-	-	PLOT a point
			=SOUND=====
x -	-	-	BELL command
x -	-	-	Built in sound commands
x -	-	-	Control sound envelope
x -	-	-	Interrupt driven music built in
			=MACHINE LANGUAGE=====
x x x	-	-	Call machine code routines
x -	-	-	Call machine code by name
x -	-	-	Link machine code to programs
x -	-	-	M/L routines parameter passing
			=OTHER=====
x -	-	-	Modem communications built in
x x	-	-	Function keys defined
x -	-	-	Function keys alterable by user
x x	-	-	Stop key disable / enable
x -	-	-	Cursor command
x x	-	-	No "garbage collection"
x -	-	-	Joystick/paddle/lightpen keywords
x -	-	-	Built in string search - IN
x -	-	-	Store a text screen for later use
x x	-	-	Long variable names
x -	-	-	Can sense SRQ interrupt
x x	-	-	Can change part of a string
x -	-	-	Built in clear screen command
x x x	-	-	PEEK, POKE, SYS, GOTO

Compare. Even more comparisons are in our other column! Check the reviews. COMAL got a straight A rating from the *Book of Commodore Software 1985*, got the highest 5 star rating from *Info Magazine*, and got the highest rating of 10 from the *Best Vic/ C64 Software* review book. Send us a SASE - we'll send you a 24 page COMAL Info booklet.

But why wait! The C64 COMAL 0.14 *Starters Kit* is only \$29.95 complete with 5 disks FULL of programs, fast loader, disk copier, and over 500 pages of information (add \$4 shipping). The top of the line, C64 *Comal 2.0 Cartridge* is \$69.95 to *Comal Today* subscribers (\$74.95 regular price). Subscribe to *Comal Today* for only \$14.95 (\$20.95 to Canada). US Dollars only. Choose COMAL, the language of choice. VISA / MC accepted!

Graphs are created by moving to an unused portion of the worksheet and entering graph commands to identify the data cells to be graphed and the details of the graph design.

Graph commands quickly can become arcane and confusing in LogiStix and the manual is not always the best source of cogent information on the subject. As in descriptions of database searches, the LogiStix manual does not by itself provide a lucid description of manipulating data from numeric into visual form.

Of somewhat more help is the disk of examples provided. Even so, a serious LogiStix student will have to study the examples and the manual carefully before mastering the full resources (fonts, colors, graph types, calibration, type size, etc.) of LogiStix graphics.

Once mastered, however, LogiStix provides ample tools to massage graphs in order to represent the data in the most potent manner. Its propaganda potential makes graphing an imposing business tool and LogiStix allows the user to change the size of X and Y axes, alter colors and thicknesses of lines, change the number and width of graph units and many other devices to make that graph say exactly what you want it to say.

Time Management

Where LogiStix diverges most dramatically from its competition is in its addition of time management and critical path planning to the spreadsheet-database-graphics combo.

The user can create a calendar of hours, days, weeks, months, years or even minutes on a LogiStix worksheet; define a regular pattern of working days (Monday through Friday, for instance) or customize unusual work schedules. Then it can identify work loads, task lengths and completion dates to find the most efficient way of completing a project.

LogiStix will automatically display the critical path of a project, the amount of float (leeway) in the completion of specific jobs and the impact of one missed deadline on individual parts of a project or on the entire project.

An AFTER command allows individual jobs in a project to be linked to one another. One task may need to be completed before another can begin, for instance. The user can specify the starting date for a job AFTER the completion of a preceding job. Then, any changes in the completion date of the first are automatically reflected in the starting date of the second and, possibly, in the completion date of the entire project. Such job dependencies are integral to time management and easily put to work in LogiStix.

dicted to its powers will want to expand their system even beyond one megabyte. A worksheet that integrates all of LogiStix's abilities can swell to imposing size in short order and will require large amounts of RAM, not to mention enormous amounts of disk storage.

Clearly, this is a program that cries out for a hard disk when they are readily and affordably available for the Amiga. Hard disk installation should be simplified with LogiStix because the program is protected with a hardware dongle that plugs into the second joystick port. The program freely may be copied but will not operate unless it detects the dongle's presence.

Hardened Amiga enthusiasts will be disappointed at the lack of

“... Once under control, LogiStix will turn somersaults of data manipulation ...”

All Together Now

Combining all the features of LogiStix is no small task and takes a virtuoso worksheet manipulator. However, once the integration of the system is grasped, the user can create worksheets with database listings of materials, spreadsheet tracking of costs and timesheets tracing the overall scheduling of the project. Whether it is construction, software programming or producing a Broadway show, LogiStix can be used to track and schedule the project. And everything can be graphically represented and printed as time charts, graphs and tables.

LogiStix works best with an Amiga with one megabyte or more of RAM. Those who become ad-

Amiga personality reflected in LogiStix's design. Mouse and menu lovers may despair, in fact. And yet, in every other way, LogiStix' keyboard intensive operation conveniently manipulates movement through worksheets and command input.

LogiStix is one of the most powerful business-oriented Amiga programs yet available. Its learning curve is steep, particularly for users who are not experienced in the use of integrated worksheet programs; and the occasionally opaque users manual doesn't help the situation. But once under control, LogiStix will turn somersaults of data manipulation.

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Vol. No. 3

Issue No. 4

P.O.C.

A Monthly Publication For Commodore™ Owners



"The Wave" by Bob Woods



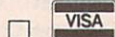
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QUICKIES:

World Games

— C-64/128

Under \$30

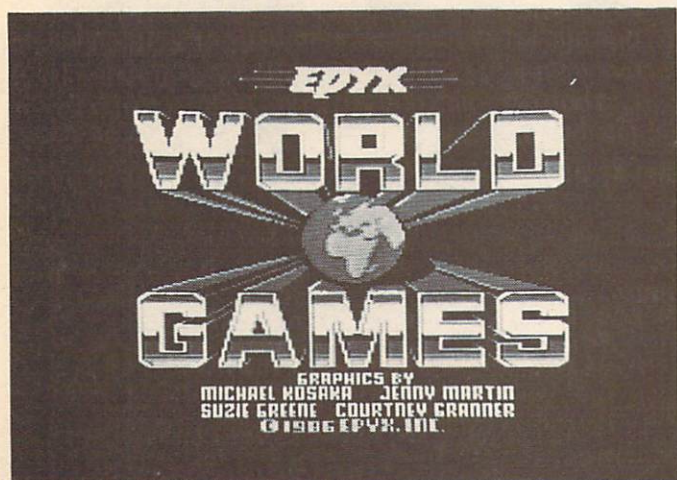
Epyx

With World Games, Epyx stretches the Summer Games series to four titles. The latest offering differs from its predecessors only in the events included. In all other aspects, it's consistent with the design, graphics quality, and playability of the preceding parts of the series.

The new events, scattered around the world, include Barrel Jumping, Weightlifting, Cliff Diving, Slalom Skiing, Log Rolling, Bull Riding, Caber Tossing, and Sumo Wrestling.

All events in World Games focus on timing, with much less emphasis on joystick abuse than some of the earlier running and cycling events. Some of the events in earlier Summer and Winter Games seem to have been designed by joystick manufacturers anxious to see how fast their products can be worn out.

The most unusual event in World Games is Caber Tossing. For those of you who haven't followed the Wide World of Sports closely enough to be familiar with this event, it involves men wearing kilts, accompanied by the sound of bagpipes, who throw a tree trunk (that looks like a telephone pole).



The tree/pole must be thrown as great a distance as possible and in such a manner that it flips end-over-end on its way. My favorite moment in World Games occurred when my player got off balance and the caber fell on his head. Oh well, I never did claim to be normal . . .

Cliff Diving takes you to Acapulco. This event again focuses on timing. To clear the rocky cliff, the diver must remain extended until the very last moment. In the higher levels it becomes important to time impact with the water to coincide with the ebb and flow of the waves. The manual also offers the irresistible piece of trivia that Mr. Raul Garcia dove from the legendary cliff 35,000 times. Even the most ardent gamer will find that a difficult record to match!

All in all, the graphics live up to the high standard defined earlier in the series. This collection of events is unique, though it does give the impression that future "Games" will have to dig deeper into the barrel to come up with new events.

Each event is very playable and entertaining, although nothing here is quite as intriguing as the Kayaking in Summer Games II.

If you've liked the earlier titles in the series, you won't want to miss this one. If, however, you haven't been excited by those, there's nothing different enough here to win you over.

Randy Chase

Deluxe Video

Advanced Users Guide

— Amiga

Free to registered DVideo owners

Electronic Arts

If you have purchased Deluxe Video and haven't received this in the mail, check with your dealer. This 72-page DVideo tip sheet written by Matthew Leeds helps DVideo owners dip productively into the sometimes imposing resources of this history-making Amiga program.

Part of this Advanced Users Guide seems written as a justification for the existence of DVideo. So expect a little sales pitch while skimming the pages.

On the positive side, this enhancement to the DVideo owners manual teaches you how to organize your videos in advance, adds suggestions on using cel animation, provides hints on timing disk access and, overall, does a lot more hand-holding than the original manual.

The Advanced Users Guide is a must for all DVideo owners. And no one can say the price isn't right. Kind of makes you wish you had sent in that registration card, huh?

Bob Lindstrom

InfoMinder

— Amiga
\$89.95

Byte by Byte

A cross between outline processing and database management, InfoMinder points toward the future of information storage and retrieval on mouse/menu systems like the Amiga.

A quick description of one of the sample files is the best way to suggest the convenience and power of InfoMinder's design. A guide to San Francisco Bay Area restaurants and bars appears onscreen as a list of items from an Introduction to Drinking Establishments, not unlike an outline processor in its most compressed form.

Single entry items are shown in white text. Those items that can be expanded are displayed in orange. A mouse click on a single item brings up one or more screens of text. Click on an orange item and InfoMinder scrolls out yet more entries. In the Drinking Establishment entry, for instance, the expanded entry includes the Peninsula Area, San Jose and Marin.

The user can continue to expand these "boxes within boxes" of outline items until the last, non-expandable level, at which point a text screen (or graphics screen!) appears with the desired information. As an additional feature, the outline structure is duplicated in pulldown menus. For browsing, this interlocking outline structure is a model of ease and convenience. And the speed of the Amiga makes such browsing fast and painless.

The program was created by Jim Becker of Terapin Software and shapes up as one of the few indigenously Amigan applications to appear on the market to date. Byte by Byte is advertising the product as an ideal gateway to CD-ROM-based information and one could well imagine a CD-ROM catalog of, for instance, thousands of Amiga software programs (Oh, that the day would come!) divided into interlocking outline items of games, utilities, applications and the like. InfoMinder would greatly simplify the process of looking through such a database to find a review of a single product or, perhaps, a range of products.

However, even without CD-ROM, InfoMinder has potential in a wide variety of information storage and retrieval applications from a simple recipe file (What to do with Beef) to, possibly, an auto mechanic expert system in which advice is stored according to automotive symptoms.

At present, InfoMinder seems to be in an ongoing state of development. And yet, more than almost any application currently available, it indicates a thrilling future for serious Amiga users.

Bob Lindstrom

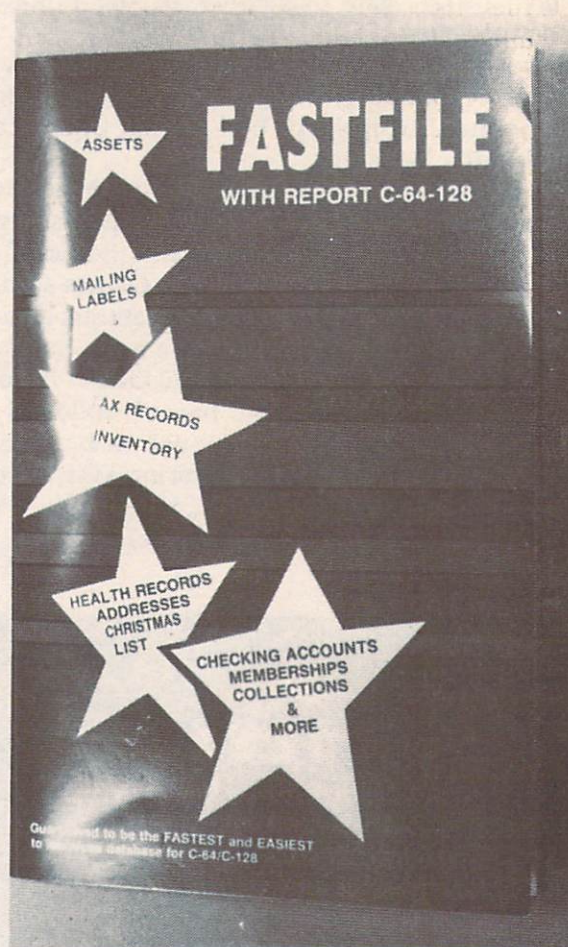
FASTFILE

— C-64/128
\$59.95

Interactive Mini Systems

Filing systems and computers were born for each other.

A filing system requires accuracy, accessibility and ease of maintenance — all qualities associated with computerized data. The trouble is that as the amount of data increases in size, the speed at which it can be accessed declines, and the effort required to organize it grows.



One major compromise made by most microcomputer filing software is to store and work on disk-based data. A great deal of speed — often by a factor of 100 — is given up in the interest of maximum file size.

FASTFILE makes no such sacrifice. Capitalizing on the fact that the vast majority of files that microcomputer owners work with are small enough to fit into memory, FASTFILE works only on memory-resident data files.

FASTFILE allows you to create, search, update, sort and report on files up to 36,000 characters in length. At first, 36K may not seem like a large file; but FASTFILE uses a variable record length internally. Each data entry is exactly as long as the data actually entered. For example, you may have created a twenty character field for "first name", but if all you enter is "Jim" the record size increases by three bytes not twenty.

FASTFILE's limited complexity (you can access only one file at a time) makes a program that is easy to learn. The 27-page manual could have been more generous, but FASTFILE comes with some helpful sample files. Its command structure is straightforward and intuitive — things are so much easier when the software does just what you might expect. Also, FASTFILE uses many of the wild cards (* and ?) of CBM DOS, as well as math symbols, in defining search criteria.

"Fast" is FASTFILE's main reason for being. As with other filing programs, FASTFILE data files are stored on disk between sessions, but once loaded into memory, further comparisons are hard to make. All but the most complex commands are instantaneous — we're talking eyeblink response time here.

At \$59.95, FASTFILE is not the most inexpensive file program available, but, if you need instant access to your data, look no further.

Grant Johnson

Pride and Prejudice

— C-64/128

\$34.95

Berzerker Works

The soft lights, suggestive looks and gentle titillation of Harlequin Romances and other brands of gothic romance novels, so-called women's books, are some of the hottest literary properties on the market. Those reams of politely steamy prose cling passionately to drug store book shelves and even make sultry appearances in TV mail order offers. Little wonder that gothic romance finally has found its way to the computer.

Pride and Prejudice by Jon Williams brings the oh-so-genteel man-hunting of 18th and 19th century Regency England to the C-64/128. Playable as a group game by up to six human players, or as a solitaire game against five computerized opponents, Pride is a high society quest for matrimony.

Six spinsters take what money a poor family can muster to spend a 15 week season amid London's social whirl. During that time they can get tutoring to increase their skills in riding, music, wit, dancing and

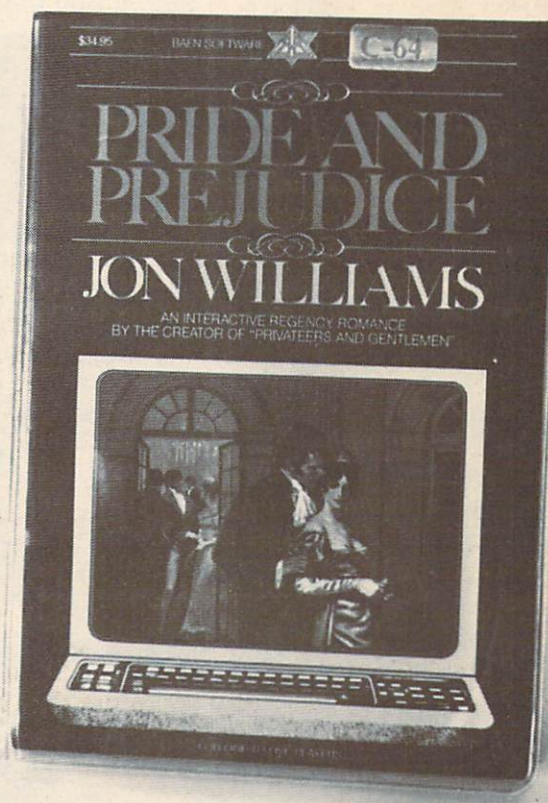
beauty; attend a variety of social events to impress the menfolk with their natural or tutored skills; or just dish the dirt with the gossiping Duchess of Elderberry in the hopes of defaming into the gutter a fellow spinster's chances of wedded bliss.

Each turn in the game corresponds to one week in London. During a turn, a player can choose to attend a social event, get tutoring or visit the Duchess. The technique of Pride is to be seen in all the right places, do all the right things, get all the right talents and chatter just enough to keep things stirred up. Though the main segments of the game rely on text screens, some nice graphics enhance the mood of the proceedings.

Though not a game of unlimited complexity, Pride can provide some provocative fun, particularly when played with a group of live, conniving human opponents. And for those who think this game is sexist, the manual explicitly states that the values and goals reflected in the game were chosen only to recreate the priorities of their period.

With software designers apparently obsessed with repeating themselves, it is refreshing to find a program that goes into a new direction in a new way. Pride and Prejudice is just such an achievement.

Bob Lindstrom



Tass Times in Tonetown

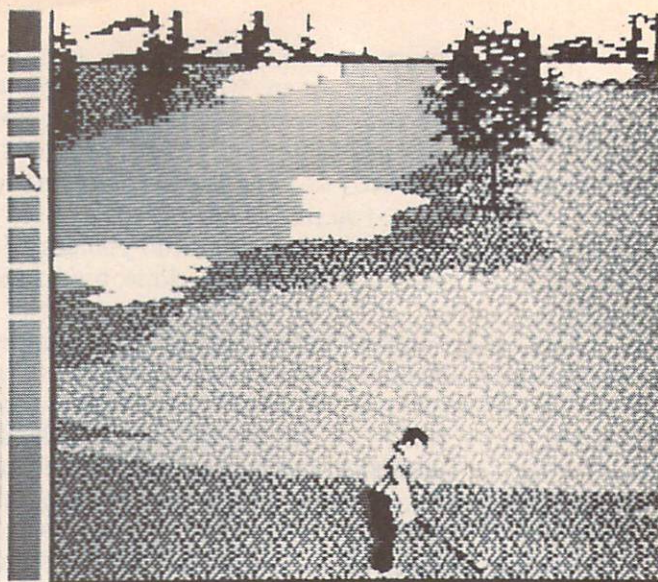
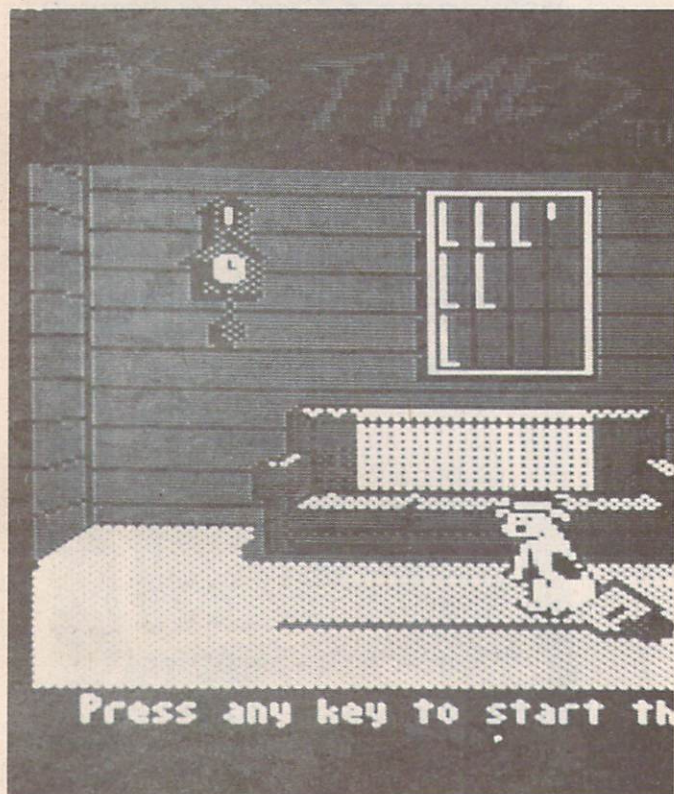
— C-64/128
— Amiga
\$34.95 C-64/128
\$44.95 Amiga
Activision

Gramps has disappeared leaving behind only a receipt for an anchovie pizza. Serves him right, the old codger, for eating anchovies on pizza. But blood IS thicker than oregano, so you cross into an alternate dimension and enter Tonetown, a whole world peopled by spike-headed, purple-haired, weirdo punks.

This new graphic adventure designed by Interplay Productions and Brainwave Creations carries on in the tradition of *Borrowed Time* and *Mindshadow*. An onscreen window depicts the crazed buildings and bizarros of Tonetown (some of them animated). For those who hate to type, a mouse or joystick-controlled cursor allows you to choose your actions from a graphic menu of options. It is possible to LOOK, TALK, DROP, TAKE, ENTER, BUY, TELL ME ABOUT, move in any direction and even examine some objects without laying finger on keyboard.

The graphics in both the C-64 and Amiga versions are outstanding, with the Amiga version frequently dazzling. The occasional appearance of sound effects, music and animation adds an element of audio-visual surprise.

Bob Lindstrom



Mean 18

— Amiga
\$39.95
Accolade

Surprising that two outstanding golf games for the Amiga should make their appearance only a few weeks apart. *Leader Board* features stunning graphics and smooth game play. Beginners seem to prefer it, hands down.

But there is an intangible reality to *Mean 18* that tends to make it the choice of the authentic golf fanatic.

Though the graphics aren't as polished as *Leader Board*, they do allow the golfer to take a 360-degree gander around the course. And unlike the inclined planes of *Leader Board*'s greens, the *Mean 18* greens have a variety of contours.

But there are other details that make *Mean 18* the golfer's choice. The ball behaves realistically as it bounces, sometimes in unexpected ways, down the fairway. The club options bear a more authentic relationship to the real thing than the *Leader Board* clubs.

And then there's the course construction mode. The would-be course architect can use his mouse and a variety of fairway features to design his own links from childishly easy pitch 'n' putt holes to club-breaking pro challenges.

A word should also be said about *Mean 18*'s sound. Using the digitizing capabilities of the Amiga, *Mean 18* has a selection of impressive audio enhancements from the rush of a swinging club to the "aaahhhh" of the crowd when you just miss that 52-foot putt.

Bob Lindstrom

Transformers: Battle to Save the Earth

— C-64/128

\$34.95

Activision

Elderly computerists, those between the ages of 25 and 40, used to look up to Jet Jackson or Tarzan during the Saturday morning kiddie TV onslaught. These days, kids admire metal robots that disguise themselves as trucks and cars: the Transformers.

David Crane, whose last game for the C-64/128 was based on the film "Ghostbusters," has taken the Transformers characters and transformed them into an artillery intensive arcade/strategy game, *Transformers: Battle to Save Earth*.

The most distinctive part of Transformers, the computer game, is a lengthy introductory slide show told by a digitized narrator. The quality is a trifle scratchy, the SID chip can only be pushed so far; but this explanatory sequence quickly is going to become the C-64 demo of the year.

The game itself combines elements of a good old-fashioned shoot 'em up with the location-hopping of Crane's *Ghostbusters* game.

Invaders are trying to tap Earth's energy supplies in an effort to stage a successful invasion. You must deploy your squad of Transformers to a variety of locations in order to discover their strategic targets, eliminate the invading fleet and squelch the takeover attempt. By viewing each location via video transmissions from each Transformer, you fire weaponry or mount an automated barrage of firepower with the goal of destroying the attackers before they deplete Earth's energy supply completely.

Because your ability to control the Transformers depends on their operating condition and because enemy fire can wreak severe damage on machinery, it is sometimes necessary to send a Transformer back to the base for repair.

In addition to the optional opening sequence graphics and sounds, Transformers has some slick visual routines. Each time you deploy a Transformer, for instance, an animated episode appears depicting the robot's transformation from humanoid to motorized vehicle. And the scenes of destruction have fast action and a few surprises such as a huge, animated . . . but that would be giving it away.

Players who aren't committed to heavy-duty action/shooting games will be bothered by the intense pace and firebutton-intensive design of Transformers. However, serious weaponry lovers will find that the strategic elements of Transformers give it more depth than the standard fly and shoot arcade game.

Bob Lindstrom

Leader Board

— Amiga

\$39.95

Access Software

As impressive as the C-64/128 version of this golf simulation was, the Amiga version takes it to new levels of graphics flair and playability.

A serious failing of the C-64 version was the absence of trees, traps and roughs. With the fairways completely surrounded by water, any stray shots that would have wandered into the trees or tall grass on a real course just plunked into the drink and had to be re-teed and reshot.

On the Amiga, the hapless player can drive off the course by a (small) country mile and still find himself playing it as it lays.

When the player drives into a sand trap, his clubs behave differently according to the limits of the sandy location and, of course, balls are only too happy to bounce inconveniently off a blocking tree.

The game system is quite similar to the C-64 original with a display of power and timing bars used to carefully coordinate power, hook and slice. And there are also the vectors that indicate wind velocity and direction (still a feature unique to *Leader Board*) and the incline of the green.

Three levels of difficulty cater to the hard-nosed golf enthusiast as well as the guy who just wants to stroll the grassy knolls and bat his golf balls around.

Bob Lindstrom



AMIGA MONTHLY:

BI Goes Bullish on Amiga

by Bob Lindstrom

And introducing — The Apple II GS!!!

No, you haven't wandered into an Apple magazine, nor has the layout department scrambled pages. And yes, I did just mention the new computer that widely has been touted as the electronic spade that could dig Amy's grave.

Sorry, as impressive as the GS is — and it is surely the most (r)evolutionary Apple computer since the original introduction of the ill-fated Lisa — as a computing package it is no competition for the Amiga.

The Ensoniq sound chip, the same used in Mirage electronic keyboards, has the potential for 15 simultaneous voices with wider frequency ranges than the Amiga (which cuts off at about 7000-8000kHz). But it seems as if a certain amount of fudging and voice coupling will be necessary to give each voice the same quality of sound boasted by one Amiga voice. And though Apple is usually first out of the gate with demos to wow the Yuppies, the early sound demos for the GS are strangely unremarkable and noticeably strident in tone quality.

Still, it should be possible to outdo Amy music with the GS, even though GS owners will have to buy a third-party add-on board to get the stereo output that Amiga owners take for granted.

Where the GS falls down is in its animation. No sprites. No blitter. No special hardware. Not even

the page-flipping that is a standard animation device on the old Apple II/plus/e/c. The highest resolution of the GS, comparable to medium-resolution on the Amiga, looks good; identical to the Amiga, in fact. But don't expect any fancy moving graphics, at least not right away.

And the price? Uh, well, ummm, would you believe about \$1900 for a system with disk drive and monitor. That is to say over \$500 more expensive than the more full-featured and powerful Amiga.

The above comments shouldn't be taken as a criticism of the new Apple II GS. The machine looks good, very good. Instead, take it as a reassurance to Amiga owners that they don't have to start kicking the cat, tearing their hair, beating the spouse or spanking the kids in frustration because they bought the wrong machine. The Amiga still sits out there at the cutting edge of microcomputer design. Now, if we could just convince Commodore to tell the world.

And Now The Good News

The silence from Commodore over the Amiga is damned near deafening these days. According to a Commodore spokesperson, advertising money for the holiday season will be devoted almost entirely to the new 64C and hardly at all to the Amiga. Boy, could we use some good news.

And there it was! And from an unlikely location.

During the early part of October, Batteries Included executive Michael Reichman left a message on the Amigaforum of CompuServe asking fellow Amigaforum members what they would tell Commodore about Amiga marketing if they could sit down with the bigwigs and chatter for an hour or so.

Reichman's invitation inspired one of the most fascinating strings of CompuServe messages seen in some time. All the usual suggestions were mentioned, some of them several times: more advertising, more software, more support, more advertising, lower prices, make good on IBM compatibility, more advertising, target the home computer market, more advertising.

Well, it turned out that Reichman's query was not hypothetical. He DID have a meeting with Commodore and (Bravo, Michael) he printed out all the CompuServe suggestions and presented them to the Commodore execs.

The bigger surprise, however, was a message that Reichman left on CompuServe following his meeting.

Batteries Included has, so far, not been an enthusiastic supporter of the Amiga. Though they have had success with some products for the Atari ST, BI has not rushed into the Amiga fray, reportedly because preorders on their pre-announced Amiga products have been less than awesome compared to sizable preorders on ST titles.



TCM-1200 FOR THE C-64 & C-128

Step into the world of high-speed Data Telecommunication! Now with the TransCom TCM-1200 300/1200 baud Modem, you can log onto a 1200 baud BBS and what would have taken many minutes to accomplish at 300 baud, you can now do in just seconds at 1200 baud. Review messages, send and receive files now in a fraction of the time it once took at 300 baud.

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However, after his coffee clatch with Commodore, Reichman assured Amigaforum members that Commodore accurately understood the Amiga's market niche, that their future plans were solid and that those plans would knock Amiga owners on their collective tushies.

No details, though.

Still, Reichman is a bright guy, a guy more than able to assess the viability of Commodore's marketing and manufacturing strategies. His endorsement seems reason enough for some good ol' Yuletide optimism. So, while you're swilling the eggnog around the tree silently take a sip for Commodore and the Amiga (No need to bring the entire family in on this one). When we find out what track they're on with Amy, maybe it will even be the right one.

New Goodies

As I write this to a magazine deadline, I haven't yet passed out the Hallowe'en candy, much less seen all the new Amiga games being released for the traditionally entertainment-obsessed Christmas market. Yet, here're a few of the items you should be asking about for those last-minute Christmas stocking purchases.

Defender of the Crown (Cinemaware) should be redefining computer graphics even as you read this. With graphics that make Saturday morning cartoons look lame and a nice mix of action and strategy, this may well be the most asked-for Amiga game this holiday season. A full review will appear in *The Guide's* Games issue next month.

After starring in a Cinemaware movie, perhaps you'd like to go into politics. It works for some people. Try Chris Crawford's **Balance of Power** — Like a Federico Fellini movie, you can't be sure if you liked it or just admired it. This cold war game of international politics (Worldwide

BS-ing, I call it) is both brain-teaser and high school social studies class. Distribute foreign aid, threaten war, cajole, conceal and get totally outrageous, just like Ronnie in the White House.

Epyx promises Amiga conversions of **Winter Games** and the excellent **World Games**. Go bobsledding in one, dive off the cliffs of Acapulco in the other. This sports series seems to have more legs than a centipede, and still no end in sight.

Several months ago, a graphic adventure program called **Deja Vu** set the Macintosh world on its ear. No more were pictures just a cosmetic embellishment to an adventure. In **Deja Vu**, you could click on a visible object and the program would describe it. "Grab" it with the mouse and tuck it away in an inventory window. What's more, the hardboiled detective atmosphere had a lot of style. Now, Mindscape has released it for the Amiga.

Now Showing

Of the items that have crossed this desk recently, I recommend two from Activision. Finally, these guys have come out with some GREAT products, both of which made my best of the year list elsewhere in this issue.

Shanghai is a graphically breathtaking version of Mah-Jongg. The ancient Oriental game used to be played by ancient Orientals while they were smoking unidentifiable Oriental stuff. The stuff and the game are equally addictive.

GBS Championship Basketball: Two on Two doubles the challenge of Electronic Arts' **One on One** by adding the element of team strategy. This is now my basketball game of choice. Sound and graphics are good, too.

Tass Times in Tone Town is yet another graphics adventure from Activision in the tradition of **Borrowed Time**. Amusing and in-

ventive, but it is, after all, just another graphics adventure.

Aegis' Art Pak No. 1 for Aegis Images looks like a garage sale at the Jim Sachs studios. This exquisitely rendered clip art for Amy doesn't have the theme or unity of EA's art disks for DPaint. It's just a lot of nice military equipment, a motorcycle, cars, trucks, dinosaurs, buildings. A catch-all. My favorite? A great version of the Disneyland castle, not to be missed.

Probably Off In The Future

I guess intense sports fanatics all over America went back into a relaxed state at the disappointing sight of SSI's **Computer Baseball** for the Amiga. Done in Amiga BASIC. Not much sound. For stats lovers only.

Perhaps they'll do better with their next two titles, the fantasy role-playing games **Phantasie** and **Wizard's Crown**.

If you can stop whistling the theme song from Firebird's **The Pawn**, take note that the new year will bring another Firebird adventure, **Guild of Thieves**.

Ken Williams of Sierra Online had a few pretty positive things to say about the Atari ST and several pretty nasty things to say about the Amiga a few months ago. Well, come on over here and get a hug, Ken, all is forgiven. Sierra has announced plans for a conversion of its latest realtime, animated graphic adventure, **Space Quest**, a rib-tickling adventure in outer space, or so they say. Graphics on the IBM version look wonderful, the Amiga should be terrific.

And, at long last, 1987 may well be the year that **Return to Atlantis** rises up from the briny depths of Electronic Arts' offices and finds its way to waiting Amigas everywhere. Just don't hold your breath, no matter how deep it gets.

NEW PRODUCTS:

Theatre Europe

Warsaw Pact and NATO countries face off in military conflict in Theatre Europe, a C-64/128 war simulation strategy game from PSS of Great Britain.

Programmer Alan Steele's scenario of wartime encounters in contemporary Europe begins when Warsaw Pact armies invade West Germany. The player can command either side and the computer controls the opposition. A map of Europe represents the locations of army divisions and the player can choose which conflict he wishes to engage.

Once he has positioned his troops, the player can join the action on the battlefield, guiding strikes by airplanes, helicopters, tanks and ground forces.

Three levels of play provide the player with progressively less information and make increasing demands on his tactical and strategic skills.

In all three levels, players have access to nuclear weaponry. However, in order to get the access code that enables their use, the player must call Intellicreations and listen to a tape-recorded message of an imaginary BBC broadcast detailing the effects of nuclear warfare. The telephone number will be included in the Theatre Europe documentation.

Theatre Europe is \$34.95 from Intellicreations Inc.

Electric Dreams

Activision, Inc. has announced a new line of software imported from around the world.

The first three products in the Electric Dreams line include programs that have hit best-seller charts in Great Britain.

Spindizzy is an action/arcade game in which the player controls a gyroscopic land mapping device to explore a landscape of 386 screens in three-dimensional graphics.

The Rocky Horror Show is a real-time, graphic adventure based on the musical and movie by Richard O'Brian. As Brad or Janet, the player wanders through Dr. Frank N. Furter's mansion in search of pieces of the De-Medusa Machine hidden throughout the house.

Zoids places the player in the midst of a galactic war between Blue and Red Zoids. The player must reconstruct Zoidzilla and use it to defeat the opposing forces.

All three titles are available for the C-64/128 for \$29.95.

Device One

Progressive Peripherals and Software has announced Device One, a new parallel printer interface for the C-64/128.

Device One uses the newest interface technology to print letterheads, banners, and automatically print hi-res pictures. Users can download fonts, pictures, and disk directories directly from disk to Device One.

The interface can use up to four different font sizes and up to 13 font styles in a single sentence and will print text and hi-res pictures on the same page. It also features a built-in Near Letter Quality mode.

Device One and its accompanying utility disk will be available for the C-64/128 for \$119.95.

Roadwar 2000

A good set of wheels, tools, human skills and supplies are the keys to survival in the post-nuclear world of Roadwar 2000, a strategic adventure from Strategic Simulations Inc.



Nineteen different vehicles can be equipped and modified as the player interacts with road gangs, mutants, cannibals and foreign army invaders.

A geographically accurate map of North America allows players to roam the continent in order to find eight scientists who are crucial to the survival of the world.

Roadwar 2000 is \$39.95 for the C-64/128.

REAL GAMERS . . .

Robot Rascals and Rock and Roll

by Robert J. Sodaro

Top of the list this time is "Frankie Goes to Hollywood" from the British software house Firebird, and, yes, Frankie says "Relax!"

If you think you've seen every type of computer game, then either you're fooling yourself, or you've already played this one. Odd, doesn't begin to describe it.

Fascinating, off-the-wall, totally wacked, and nuvo-mondo bizarro — the game is all that and more. This game is so unusual that I'm still not quite sure what you're supposed to be doing in it, but "Relax" won't be one of them.

The instructions are quite sparse on this one, which resulted in a good deal of aimless wandering at first but that adds to the charm of the game. (There is a tip sheet available by writing to Firebird — write for it, you'll need it.)

There are about two dozen things going on at the same time in this one. First up is your onscreen image (let's call him

"Frank"). He wanders around from house to house, room to room collecting things. What kind of things, you might ask? A red herring, floppy diskettes, videotapes, a gun, a live cat, a pair of socks, and several types of pleasure pills. Part of the overall object to the game is to acquire some several thousand points for "Frank" in an attempt to become a complete human.

But that's not all. You also have to solve a murder.

While wandering through the houses, you'll come across a dead body. Now, since you've found it, it is up to you to figure out whodunnit. Don't worry too much about it though, 'cause you'll have some help in determining who the culprit is, as every time you walk into a room, you'll be given a new clue ("The killer likes to sleep late." "Mr. Green has no children." "Mrs. Average gets up early." Etc.)

By piecing together the random bits of information, you'll eventually determine who committed the murder. But it doesn't solve the game, you still have to

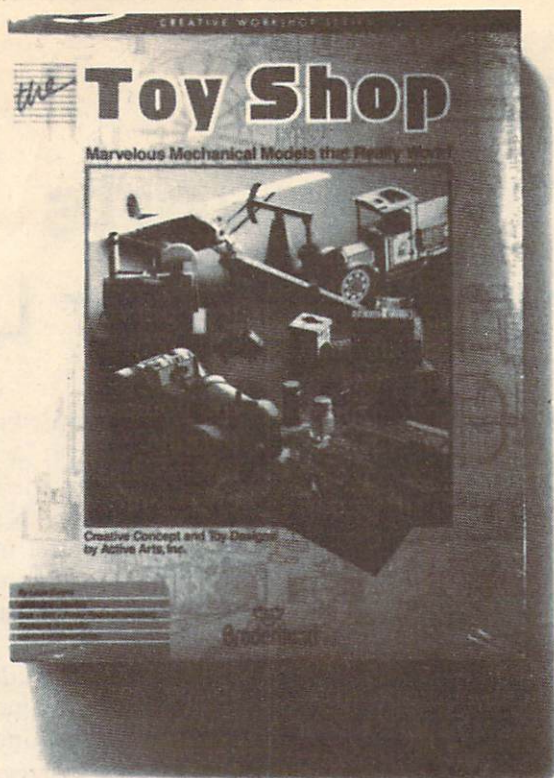
amass the correct number of pleasure points.

As for all that other stuff, when you get a video, pop it in a TV and then watch the fun! These are live videogames within the game. You "enter" the video and play the game. (You also get to enter a map or two, and play them as well.) There's bunches more, but you'll really have to see them to understand.

Our next game is another unusual, product, Broderbund's The Toy Shop.

The Toy Shop is designed to create miniature toys that actually work. You are capable of building working versions of 20 different toys from a medieval catapult to a mechanical bank. The comprehensive manual gives the user instructions on how to construct each of the toys, along with tips and suggestions.

Included with the package are wooden dowels, several strips of thin wire, and other items you'll need for construction, including special cardboard backing for your printed blueprints. The multiple disk program also allows



you to alter fonts, and designs on each of the toys so that you may individualize them. Also, additional hardware can be purchased so you can make additional toys. All design innovations can also be saved to disk for future use.

The Toy Shop is not just an innovative software product that designs neat little model toys; it is a wholly interactive product that will prove to be of interest to computer enthusiasts of all ages.

Next up is Mercenary: Escape from Targ from Datasoft. In Mercenary, you're an intergalactic brigand-for-hire, and your ship has crash-landed on Targ. Due to this turn of events you find yourself allied with the native Palyars against the invading Mechanoids. Thus, you must aid the Palyars (thereby making a profit) so you can purchase a new interstellar vehicle.

An interesting aspect of this vector graphic game is that it requires both a joystick, and keyboard commands to play. Movement (either shipboard or on

foot) is via the joystick, with the keyboard utilized to Take and Drop objects, Board and Leave your craft, operate the Elevator, and set your vehicle's speed (0-9). You can also Save and Load games or even Quit a desperate situation. The problem with quitting is that when you return to Central City objects you're carrying will be scattered.

Included are a set of maps that you'll need to navigate through the various complexes on Targ. One is an outside grid map offering an overview of the populated section of Targ; a second has interiors of several buildings, and a third a 3-D cutaway of the Orbital complex.

However, prior to marking up the maps, I recommend that you make a number of photocopies, so you'll have clean copies when playing subsequent adventures. You might choose to check out the wilderness areas, since the manual states that there are some interesting places out there.

When you finally manage to lift off from Targ, you'll want to save your game to disk, as it will serve as a starting point to your next adventure in Mercenary II, coming soon to a software store near you.

My last review is of Robot Rascals (Electronic Arts) from Dan Bunten and Alan Watson. At CES in June, Bunten described this game as being "pure fun." After sitting around in his hotel room playing it, I'm inclined to believe him.

Designed for two to four players (it can't be played solo, and is best with four) the game involves cute little robots who must take turns gathering up a number of items and then return to their "home" position before the others can do the same. There are good and bad items, each with a corresponding game card. The items all contain silly names like Helpless Handbag, Velocity Vitamin, and Transistor Taco.

Sounds simple, huh? Not quite. First of all, the computer keeps changing the rules and then there are always those other players. Between each turn the Computer will tell you things like "Pass the garbage to the left" (dump your bad cards on your neighbor), "Take/give a card" (accept or steal one from same); or it will pull a reverse on you, forcing you to look for the bad items and discard the good ones.

Sometimes the computer (which scatters the items at the start of each game) will place items in rough terrain, or even beyond your reach. Further, as a player, you can drop a valued item another player needs into the lake, thus insuring they can't win.

If you want fun, and I do mean FUN, then look into Robot Rascals.

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I DON'T SPEAK HEXIDECIMAL:

From Skeptics to Converts

Another Triumph for Computer Living

by Shelly Roberts

These were two of the people who thought I had gone mad, contracted a socially unmentionable and highly contagious disease.

"Computers. You're into computers. Hmmm. How interesting."

You know the type. They're everywhere.

Only, that was a while ago. And now they were invited to an after-the-season long weekend just before we closed the summer house. And one of them asked the most surprising question:

"Do you mind if I bring the Macintosh? I have a report to finish."

Now this was surprising on a couple of fronts. First of all, would we mind? She had to be kidding. Us. The original Computer Couple. No problem.

Secondly, a Mac? Well, no accounting for tastes.

Thirdly . . . WHAT!!!! SHE wanted to bring a computer? Couldn't write her report without it? Whatever happened to the wholly writ on yellow pad with color coordinated Ticonderoga No. 4 hard lead pencil that she clung to self-righteously?

She was the last person I ever expected to become a convert, much less one who would drag a Big Mac across a couple of islands where cars were prohibited. Apple doesn't make a lap Mac, so we had to be dealing with a hardcore 40-pound believer here. I had never had my hands on a Mac.

Knowing how possessive people can be about their own personal computers, I hoped that maybe after she went to bed I could sneak out and give it a bit of a boot.

I couldn't wait for the weekend.

The ferry coughed them into the pre-autumnal mists complete with cases, val-packs, adorable untrained puppy, and a shoulderful of full sized Mac Pack.

She was being accommodating. Her Significant Other was wardrobeed in looks familiar to Computer Widows and Widowers everywhere. Clouds of "Must you?!s" and vaguely-veiled curled lips filled the house, and soon we were regaled with pointed anecdotes about seeing Her these days only by the faint grey glow of the black and white monitor. The S.O. referred to it as the "after-glow". I didn't ask "After what?"

We were amused. The Computoids sympathized with Her. The Widows and Widowers with her S.O. The Analogues chuckled at the absurdity of both.

And then it happened. Right before our very eyes. A conversion of such monumental proportions that you usually only get to read about it, not see it happen.

Someone said to the S.O., an artist of Significant Talent, "Have you tried the MacPaint Program?"

"Oh," She said. "I have that. It's on a sampler pack I brought

with me. I don't know how to use it though." It was obvious to everyone that She was anxious to find a way — ANY way — to involve, or at least interest the S.O. in something computer, hoping that some understanding of the addiction would lead to some tolerance of the addicted.

The MacPaint-er shouldered over to the machinery, dragged up

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a chair for the beleaguered S.O., and booted up.

It was miraculous. It was significant. It was astounding. And these were just a few of the words the S.O. used, discovering what most of us already knew.

1. It was easy.
2. It was a great working tool.
3. It allowed the work to be saved in progress.
4. It allowed the mind to be changed.
5. It was fun.

The very first time out on the mouse (the tamed animal leashed to the Mac to lead it. Imagine being led around by a mouse. Eek.) the S.O.'s work looked very much like the flat art etching we were already familiar with at home on their walls.

We were, of course delighted. The conversion was adorable. It

was as dear to us as watching the puppy learn a new trick. It meant that we would have something else in common to talk about when the weekend ended.

"Now we save the masterpiece," tutored the MacGuide. "You pull this menu down and . . ." Oops. The MacSampler was a sneaky son of a gun. It wouldn't let you save. It was even sneakier than that. It wouldn't let you reboot after a few trials. It wanted you to go out and pay full price for the software like the good, honest, American consumer they know you to be. The MacPlanners could give hooking lessons to Drug Dealers on the streets of New York.

The weekend plans were enlarged the next day to include, along with the nature walks, the sea glass searches, and the row boat races, a trip to the tiny island

computer store to purchase the MacProgram. They didn't MacHaveIt.

But no matter.

We were very clear that the first civilized landbased enclave encountered on the return trip would render up an immediate retail opportunity and a bootable copy.

So these people who used to think that I was crazy caught the crazy bug themselves.

Soon they will be fighting over who gets to use the computer. When. And for how long.

Soon they will be a two computer couple. Just like computer couples the planet over.

Just like us.

We are everywhere.

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PASCAL'S TRIANGLE:

Of Fractional Interest

by Carmen Artino

This month I will finish the discussion of computing b^x started two columns ago by treating the case when x is a fraction. We shall assume that $0 < x < 1$; later on, we will see that this restriction poses no problem at all.

Before beginning with the algorithm itself, let's return for a moment to DECTOBIN. This time, however, we want to convert a fraction (same restriction as above) to binary. I will explain the method for doing this using an example, say $1/6$. You should be able to determine why it works by rereading BINTODECTOBIN.

In the decimal system, the fraction $1/6 = 0.6875$, and in binary, $1/6 = 0.1011$. The positions to the right of the *binary* point indicate powers of $1/2$, not powers of $1/10$, as they would in decimal notation. To convert $1/6$ to binary proceed as follows:

1. multiply 0.6875 by 2:
 $2 \times (0.6875) = 1.3750$
2. Save the integer part, a 1 here, as the first binary position in the binary representation for $1/6$: 0.1
3. Multiply the fractional part obtained in step 1 by 2 again:
 $2 \times (0.3750) = 0.75$
4. Again, save the integer part, a 0 this time, as the next bit in the binary representation of $1/6$: 0.10
5. Proceed as in step 3:
 $2 \times (0.75) = 1.5$
6. Save the integer part again: 0.101
7. $2 \times (.5) = 1.0$
8. Save the integer part: 0.1011
9. At this point, the fractional part obtained in part 7 is a 0, so we stop, since successive multiplications by 2 will continue to yield 0's.

Thus $1/6 = 0.6875$ in decimal; $1/6 = 0.1011$ in binary. This can easily be verified by expanding 0.1011 in powers of $1/2$:

$$0.1011 = 1 \times (1/2)^1 + 0 \times (1/2)^2 + 1 \times (1/2)^3 + 1 \times (1/2)^4$$

Before discussing the Pascal code for this procedure, we must point out an important caveat. Try the same procedure on $1/3 = 0.8$.

1. $2 \times (0.8) = 1.6$
2. Save the integer part: 0.1
3. $2 \times (0.6) = 1.2$
4. The integer part is a 1: 0.11
5. $2 \times (0.2) = 0.4$
6. Our binary representation is now 0.110
7. $2 \times (0.4) = 0.8$ so that the binary representation at this point is 0.1100

Do you now see what the problem is? That's right! We are back to 0.8; if we continue in this manner, the group of binary digits 1100 will simply repeat. Therefore, 0.8 in binary is 0.1100 1100 1100 . . . ; i.e., 0.8 in binary is a repeating "decimal"! Such a representation causes no problems mathematically speaking, but it should be quite obvious that a computer, Commodore 64 or otherwise, cannot store an infinite number of bits. This simply means that any machine representation of 0.8 or any other fraction that repeats in its binary representation, by nature, will have to be inexact.

This brings us to the method used by the C-64 to store fractions or "floating point" numbers. Here is a somewhat simplified way to describe this internal representation. Normally, the C-64 operating system sets aside six bytes to store a fraction in mantissa-characteristic format. If m = mantissa and c = characteristic, then mantissa-characteristic format means the number is expressed as $m \times 2^c$. If we now imagine that the six bytes used to internally store the number are contiguous, then the MSB is used for the characteristic (i.e., the exponent), the next four bytes

are used for the mantissa, and the sixth byte is used as a sign indicator:

exponent	mantissa	sign
----------	----------	------

The characteristic is representable as a one-byte integer stored in "excess 128" format. This just means that 128 is added to the characteristic to take care of negative exponents. For example, a characteristic of -1 would be represented as $-1+128=127$, or in binary as 10000000 while a characteristic of 4 is represented as $4+128=132$, in binary as 10000100. Thus the range of the characteristic is from -128 to $+127$ internally stored as 0 to 255.

The next four bytes are used for the mantissa in *normalized* form. This means that the most significant bit of the first mantissa byte is always a 1 and the characteristic is adjusted, of course, to reflect this normalization. The sign of the number is carried in the sixth byte, 0 = positive, 255 = negative. Let's look at a few examples. Imagine for the moment that the binary point is just to the left of the most significant bit of the first byte of the mantissa:

↑ imagined binary point

(This imagined position of the binary point is not always correct, but it will serve our purposes here.) Since $1/6$ in binary is 0.1011, it is expressed in *normalized* binary floating point form as $.1011 \times 2^0$. We must add 128 to the exponent, which is 0 in this example, to get its representation and therefore $1/6$ internally looks like:

10000000 10110000 00000000 00000000 00000000 00000000

On the other hand, $3/6 = 0.1875$ has the binary representation 0.0011. To write this number in *normalized* binary floating point form, we must move the binary point two places to the right and adjust the characteristic accordingly. Thus, $0.0011 = .11 \times 2^{-2}$. Here the characteristic is -2 , which internally is represented in excess 128 form; that is, we must add 128 to this value to get 126. In binary, 126 is 01111110 so that internally, $3/6$ looks like:

01111110 11000000 00000000 00000000 00000000 00000000

This, in a nut shell, is a simplified version of how a fraction is stored on a Commodore 64. Some other considerations need to be made but these examples will give you the general idea. Knowing the internal representation, we can then determine the largest and smallest numbers that can be represented and their *precision* (the number of decimal places when the number is printed.) For the Commodore 64, the range is from about 10^{-39} to about 10^{38} with a precision of about nine decimal positions — fairly respectable! (A computation is actually carried out no more than nine

decimal places using an "overflow" byte but is then rounded to nine).

When Pascal is implemented on the C-64, the implementer has the option of using the method described above, or one of his or her own design; most opt for the former since it is already there. Thus, most Pascals for the C-64, in particular, Oxford Pascal, give about nine decimal place accuracy. At least one implementation gives about 11 place accuracy by using a modification of the above described method.

With this information in hand, we can now proceed to examine the algorithm for computing b^x when x is a fraction, $0 < x < 1$. The algorithm will make use of the procedure for converting x to binary and a procedure for normalizing the mantissa but let's leave that for a moment and concentrate on the method itself. Let's use $x = 1/6$ as our example again. Since $1/6 = .1011$ in binary, $b^{1/6} = b^{.1011}$. Now in its expanded form,

$$.1011 = 1 \times (\frac{1}{2}) + 0 \times (\frac{1}{2})^2 + 1 \times (\frac{1}{2})^3 + 1 \times (\frac{1}{2})^4 = \frac{1}{2} + 0 + \frac{1}{8} + \frac{1}{16}$$

so that

$$b^{.1011} =$$

$b^{1/2} \times b^0 \times b^{1/8} \times b^{1/16}$. Now $b^{1/2}$ is just $\text{SQRT}(b)$ (SQRT = square root) and a quantity like $b^{1/8}$ or $b^{1/16}$ or b to any power of $1/2$ may be obtained by iteration of the SQRT function; that is, $b^{1/8} = \text{SQRT}(\text{SQRT}(\text{SQRT}(b)))$ since $1/8 = (1/2)^3$.

We can see that the method employed here is nearly the same as the one presented last month for \ln -power; the basic difference lies in the use of SQRT instead of SRQ . We need a variable, *pwr*, initialized to 1.0 as before. Next, we will need to convert the fraction x to binary — but in doing so, we will also need to keep track of the bits. To see why, suppose the mantissa uses four bytes for its representation. Since the mantissa is normalized, the high order bit of the first byte will always be a 1 bit. Therefore, our algorithm should not perform any computations until a 1 bit is detected. After this, the computation should continue through its main loop; i.e., the procedure given above, 32 times because 32 is the number of bits in the representation of the mantissa. If our mantissa used five bytes, the loop would be executed 40 times, etc. Thus we will also need a counter variable, let's call it *count*; a constant set equal to 32, let's call it *limit*; a multiplier, call it *mult*, set equal to $\text{SQRT}(b)$; and a flag, let's call it *that*, to signal when a 1 bit has been found. The algorithm, in pseudocode, then looks like this:

```

set flag equal to FALSE;
WHILE count <= limit DO
BEGIN
  Find the next bit in the binary representation of x;
  IF the next bit is a 1 bit THEN

```



```

BEGIN
  multiply pwr by SQRT(mult);
  set flag equal to TRUE;
END;
replace mult by its square root;
IF flag is TRUE THEN increment count b
y one;
END;

```

Note that the first IF statement detects a 1 bit. The first time that occurs, flag becomes TRUE and remains TRUE throughout the rest of the computation. Also notice that count is never incremented until flag becomes TRUE. Thus the WHILE loop is executed *at least* 32 times. This assures that normalization takes place. All that now remains is to present the above routine in Pascal. So, without further ado, here it is!

```

FUNCTION fractpower(b,x: REAL):REAL;
CONST limit = 32;
VAR pwr,mult: REAL;
    count,bit: INTEGER;
    flag: BOOLEAN;
BEGIN (* fractpower *)
  flag := FALSE;
  count := 0;
  pwr := 1.0;
  mult := sqrt(b);
  WHILE count <= limit DO
    BEGIN
      bit := TRUNC(2 * x);
      x := 2 * x - bit;
      IF bit = 1 THEN
        BEGIN
          pwr := pwr * mult;
          flag := TRUE;
        END;
      mult := Sqrt(mult);
      IF flag = TRUE THEN count := count
+ 1;
    END;
  fractpower := pwr
END;

```

The CONST limit may be changed to suit your hardware/software configuration. For example, if you use your C-64 Pascal compiler to prepare programs for a class at school and you are required to use the school's mainframe computer, find out its characteristic-mantissa configuration and make the change accordingly.

What happens if we need to find, say, $b^{23.6875}$? Since $23.6875 = 23 + 0.6875$, elementary algebra comes to our rescue again, because it was there we learned that $b^{23.6875} = b^{23} \times b^{0.6875}$. In Pascal, we can simply write a statement like

```
y = intpower(b, 23) * fractpower(b, 0.6875);
```

(intpower was discussed last month). This overcomes the restriction mentioned at the beginning of the article. If $x < 0$, then $-x > 0$ and b^x may be found by computing $1/b^{-x}$.

Here is a Pascal program that you can use to test the FUNCTION just given. It computes base to the xpon power, where base and xpon are declared as type REAL, using FUNCTION fractpower then compares the result to the "machine" value using $\text{EXP}(xpon \times \text{LN}(\text{base}))$. The program was run under both Oxford Pascal and KMMM Pascal with remarkably good results:

```

PROGRAM testpower(INPUT,OUTPUT);
VAR base, xpon:REAL;
    j:INTEGER;

(* Insert here FUNCTION fractpower as given above. *)

BEGIN (* testpower *)
  PAGE;BORDER(2);SCREEN(2);PEN(1);
  FOR j := 1 TO 5 DO
    BEGIN
      WRITELN('Enter a real base and a')
      ;WRITELN('fractional exponent. ');
      READLN(base,xpon);
      WRITELN;WRITELN(base,'to the',xpon
      ,'power');
      WRITELN('is',fractpower(base,xpon)
      );
      WRITELN;WRITELN('The machine value
      is',EXP(xpon*LN(base)));WRITELN
      END;
      BORDER(14);SCREEN(6);PEN(1)
    END.
  END.

```

NOTES:

1. The program does not check on the value of xpon. If $xpon \geq 1$ or $xpon \leq 0$, the results will be unpredictable. If $base < 0$, fractpower will halt with a runtime error since the argument of Sqrt cannot be negative; no check has been made for this value, either.
2. The version given here was developed using Oxford Pascal, but was also run, with a few cosmetic changes, using the remarkably fast KMMM compiler. If you have this fine product, delete the BORDER, SCREEN, and PEN statements (or better yet, implement them yourself) and replace the PAGE statement with WRITE(chr(147)).
3. If you desire a simple routine to convert a decimal number x , $0 < x < 1$, to binary, you can easily write one by recovering the first two lines in the WHILE loop in fractpower and incorporating them into your routine. Those two lines are used to find the next bit in the binary representation of x .

The author welcomes comments and suggestions concerning this column. The interested reader may write to the author at P.O. Box 43, Gunderland, NY 12084.

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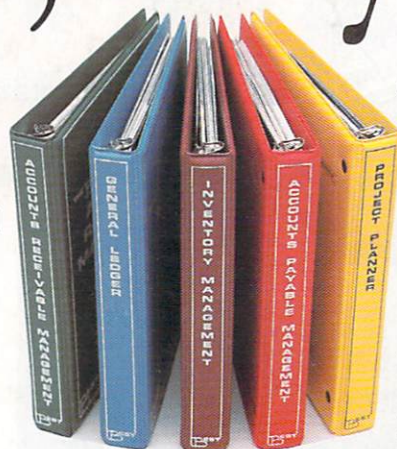
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